A Work Project, presented as part of the requirements for the Award of a Master Degree in Finance from the NOVA – School of Business and Economics.

# AUTOMOTIVE INDUSTRY IN A BUSINESS MODEL REVOLUTION

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A Project carried out on the Master in Finance Program, under the supervision of:

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JANUARY 2020

Automotive industry in a business model revolution

Abstract

The presented equity research report has the objective to determine the fair value of the Italian luxury performance car manufacturer Ferrari N.V. To achieve this, an in-depth analysis of the company's business and industry in which it operates is conducted. Subsequently, a DCF valuation is performed based on the assumptions made to achieve the forecasted financials. The result is a share price of €200.05 as of January 2 2021, which represents an upside of 36% compared to the current price of €149.55 and implies a BUY investment recommendation.

Keywords

Ferrari, Fair value, Discounted cash flows valuation

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NOVA SCHOOL OF BUSINESS & ECONOMICS

**MASTER IN FINANCE**

# FERRARI N.V.

# COMPANY REPORT

*LUXURY PERFORMANCE AUTOMOTIVE*

3 JANUARY 2020

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## Automotive industry in a business model revolution

*How Ferrari is adapting to current industry trends*

- **Industry:** The luxury automotive industry is at a turning point. Consumer preferences, broader industry trends and regulatory requirements direct car manufacturers to continuously explore and develop new technologies. Furthermore, it compels OEMs to pursue new markets such as hybrid and electric mobility. These contingencies force OEMs to radically change the product mix, placing stress in costs mostly related with R&D and PP&E.

- **Ferrari:** Significant changes are expected to occur in Ferrari's businesses. Not only is it debuting new models at an unprecedented rate, but it is also entering in new segments such as SUVs and hybrids, which significantly alter the product mix. This is forcing the company to deploy considerable resources, which puts pressure on operating margins. Also, engine sales to Maserati are weakening and expected to cease in 2021. As for branding activities, half of the licensing agreements are expected to be terminated in an attempt to position Ferrari's licensing and retail activities in the same luxury level as its cars.

### Company description

Ferrari is an Italian luxury sports car manufacturer. The Ferrari brand symbolizes exclusivity, innovation, state-of-the-art sporting performance, and engineering heritage. In 2018 Ferrari shipped 9251 cars with an average revenue per car of €274 thousand. Ferrari plans to introduce 15 new models in the 2019-2022 period and is investing heavily in the hybridization of its product range. Ferrari competes with both large automotive groups, as well as small producers. Ferrari benefits from its powerful brand, Formula One, consumer loyalty and unique driving experience to remain a leader in its segment.

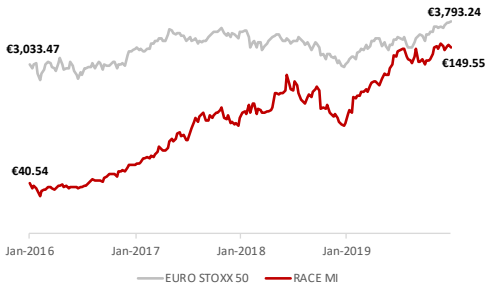
| | |
|---|---|
| **Recommendation:** | **BUY** |
| *Vs Previous Recommendation* | - |
| **Price Target FY20:** | **200.05 €** |
| *Vs Previous Price Target* | - |
| **Price (as of 3-Jan-20)** | **149.55 €** |

Thomson Reuters

| | |
|---|---|
| 52-week range (€) | 84.08-156.35 |
| Market Cap (€m) | 28,681.29 |
| Outstanding Shares (m) | 185.87 |

Source: Thomson Reuters

**Ferrari vs Eurostoxx 50**




Source: Thomson Reuters

| (Values in € millions) | 2018 | 2019E | 2020F |
|---|---|---|---|
| Revenues | 3,420 | 3,672 | 4,040 |
| EBIT | 827 | 792 | 721 |
| Net Profit | 783 | 641 | 593 |
| Gross margin | 58.8% | 58.8% | 57.3% |
| PP&E | 851 | 1,161 | 1,277 |
| Net Financial Assets | (1,207) | (1,220) | (1,271) |
| EPS | 4.17 | 3.45 | 3.21 |
| P/E | 21.26x | 43.29x | 62.41x |
| ROIC | 52.1% | 31.7% | 27.7% |

Source: Ferrari Annual Report 2018 and Nova Research Team estimates

*THIS REPORT WAS PREPARED EXCLUSIVELY FOR ACADEMIC PURPOSES BY JOÃO ALVES AND JOANA SILVA, MASTER IN FINANCE STUDENTS OF THE NOVA SCHOOL OF BUSINESS AND ECONOMICS. THE REPORT WAS SUPERVISED BY A NOVA SBE FACULTY MEMBER, ACTING IN A MERE ACADEMIC CAPACITY, WHO REVIEWED THE VALUATION METHODOLOGY AND THE FINANCIAL MODEL. (PLEASE REFER TO THE DISCLOSURES AND DISCLAIMERS AT END OF THE DOCUMENT)*

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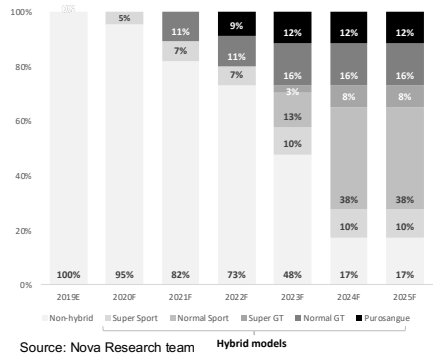
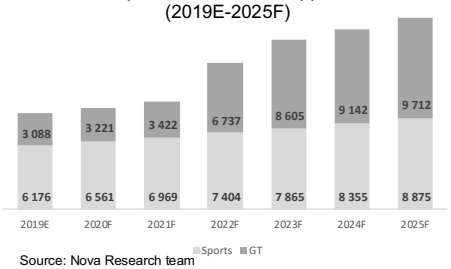
Hybrid versus non-hybrid models breakdown (2019E-2025F)



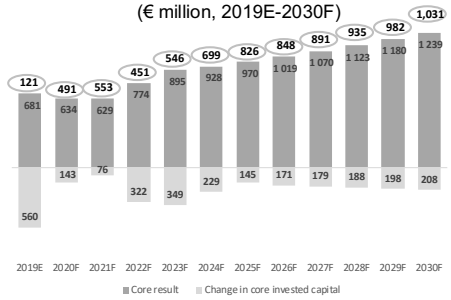

Source: Nova Research team

**Chart 2:**
Sport and GT units shipped (2019E-2025F)



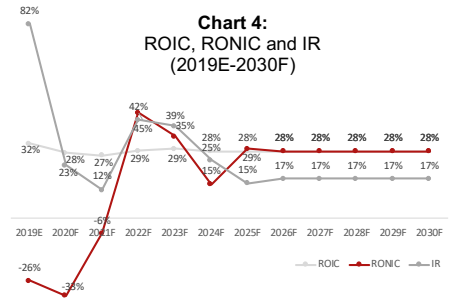

Source: Nova Research team

**Chart 3:**
Core business Free Cash Flow (€ million, 2019E-2030F)



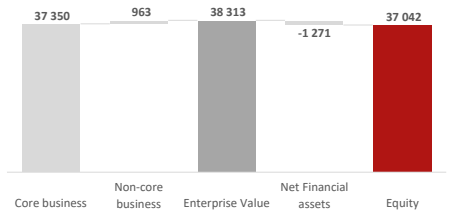

Source: Nova Research team

**Chart 4:**
ROIC, RONIC and IR (2019E-2030F)




Source: Nova Research Team

**Chart 5:**
Valuation waterfall (€ million, 2020F)




Source: Nova Research Team

# Executive summary

Ferrari's luxury car offering is set to become the most complete ever thanks to the unprecedented new model introductions, including the first of many hybrid and SUV models. Nova Research Team expects that over the next five-year period, hybrid (Chart 1) and SUV models will make most of Ferrari's units sold, which are expected to grow by 101% in the 2018-2025 period (Chart 2). We are confident that the increase in units is demand-driven and does not compromise the company's low volume strategy and exclusivity. The increase in volume is accompanied by a general increase in price, mostly driven by the premium charged in hybrid models, which are expected to represent 83% of the units sold by 2025. However, hybrid models are expected to carry lower margins.

V6 and V8 engine sales to Maserati are weakening, and are expected to cease in 2020 and 2021, respectively. As for branding activities, half of the licensing agreements are expected to be terminated in an attempt to position Ferrari's licensing and retail activities in the same luxury level as its cars.

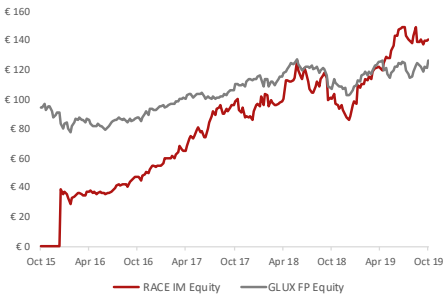
From fiscal 2019 to 2025, Ferrari's core business free cash flows are expected to vary significantly not only due to the effects on revenues and operating margins mentioned above but also due to the significant capital expenditures required by the extensive hybridization of the product offering. For this reason, an annuity period was included in the valuation, in which Ferrari's cash flows are expected to evolve more consistently, before reaching the terminal value (Chart 3).

In the short-term, Ferrari will disburse vast sums of capital in renovating its fleet, factories, and technology. Hence, its RONIC will be negative and below ROIC. From 2022 to 2025, RONIC becomes positive, primarily driven by cash flows from cars and spare parts. However, there is an unfavorable product mix as the years go by related to a rise in manufacturer costs of hybrid cars, contributing towards a decline in RONIC. From 2026 onwards, RONIC will stabilize (Chart 4). In perpetuity, Nova Research Team expects RONIC to equal WACC. Ferrari is not likely to hold its competitive advantages, which are mainly propelled by its unique driver experience that is threatened by technologies such as autonomous vehicles.

Discounting the forecasted core business free cash flows back at a WACC of 4.63% and adding the non-core business and net financial assets at book value, we arrive at an equity value of €37 billion at the end of 2020 (Chart 5). Our €200.05 target price is derived via a DCF analysis, using a 4.84% cost of equity, 1.36% pre-tax cost of debt and 2.5% terminal value growth.

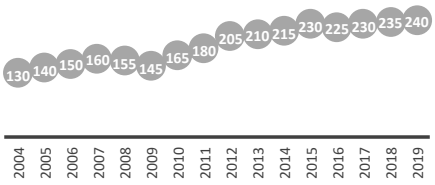
# The Luxury Automotive Industry

**Chart 6:**
Share price Ferrari versus Amundi S&P Global Luxury ETF
(€, 2015-2019)




Source: Bloomberg
Note: Amundi S&P Global Luxury UCITS ETF seeks to replicate the evolution of the S&P Global Luxury index. This ETF enables investors to benefit from an exposure to around 80 major luxury-related securities in the world. The fund's top holdings include LVMH, Cie Financiere Richemont, Kering, Daimler, Estee Lauder, Pernord Ricard, Diageo, Nike, Shiseido and Hermés.

**Chart 7:**
Worldwide luxury goods market
($ billion)




Source: Bain & Company

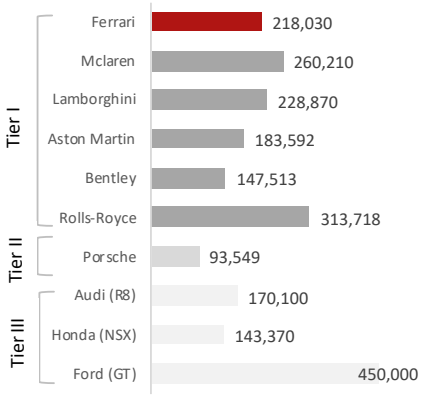
While Ferrari is an automotive manufacturer, it is essential for one to grasp the difference between the luxury automotive industry, where Ferrari operates, and the broader luxury industry. The luxury car industry is similar to other luxury goods in many aspects, such as in quality, rarity, exclusivity, high degree of non-functional associations, and rarity. All in all, it contributes to higher pricing when compared to mass-market goods.

Ferrari has followed close growth patterns with the broader luxury market (Chart 6). Historically, luxury OEM's[1] have proven resilient against global macroeconomic downturns even though they are usually affected by them since, factors such as economic confidence, expectations regarding future income streams, and social acceptability on luxury goods impact their sales. In moments of economic stagnation and recessions, however, luxury OEMs managed to minimize impact and reverse it quickly (Chart 7) as a result of the increase of new product launches, which can have a disproportionate impact on sales of luxury goods in light of the discretionary nature of consumer spending in this market.

Sales in the luxury performance car market are strongly driven by new product launches, unlike what happens in other segments of the broader luxury market. Therefore, the market share of luxury producers fluctuates over time, reflecting the timing of product launches. In such an emotional investment, the excitement of novelty and exclusivity of owning a luxury car is capable of producing and capturing its own demand from clients.

## Competition

**Chart 8:**
Luxury performance car market players
average car price (€)



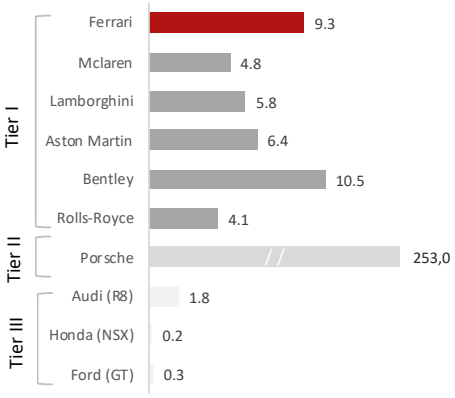

Source: Nova Research Team
Note: Players are divided into tiers based on the similarities with Ferrari in terms of market positioning and strategy

Competition in the luxury performance car market is clustered in a reasonably small number of manufacturers, which include both large automotive companies that own luxury brands such as BMW and Volkswagen, as well as smaller producers exclusively focused on luxury cars, such as Ferrari and McLaren.

The luxury performance car market consists of two segments: sports and GT[2] cars. Recently, the market shifted somewhat by placing more emphasis on GT cars and the lower-priced range of the sports car market, with larger automotive groups expanding their offering of premium cars to enter the luxury car market[3]. Brand strength and the appeal of the products in terms of performance, novelty, styling, and innovation as well as on the manufacturer's ability to renew its product

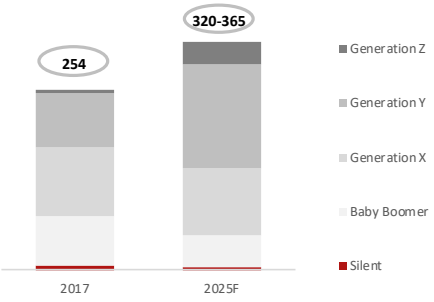
[1] Original Equipment Manufacturer
[2] Gran Turismo
[3] Ferrari Annual Report 2018. Accessed January 1. https://corporate.ferrari.com/en/2018-annual-report.

**Chart 9:**
Luxury performance car market players units sold 2018 (thousands)




Source: Nova Research Team
Note: Players are divided into tiers based on the similarities with Ferrari in terms of market positioning and strategy

**Chart 10:**
Share of global personal luxury goods market by generation (€ billion)




Source: Bain & Company

***"There's a potential for about 27% of the luxury car market to be female"***

***Carlee Hardaker***
***(Aston Martin's senior manager of Global Customer and Market Intelligence)***

offerings regularly to continue to stimulate customer demand are some of the main drivers for competition in the luxury car market.

Larger automotive groups that own luxury car manufacturers have access to more financial resources than small luxury car producers hence, having more flexibility in planning for product launches and capital spending over time. Price and total cost of ownership drive competition among similarly positioned luxury performance car producers. For the sports cars, Ferrari's main competitors are Lamborghini, McLaren, Ford, Honda, Porsche, Mercedes, Aston Martin, and Audi. Regarding the GT models, their primary competitors are Rolls-Royce, Bentley, Aston Martin, and Mercedes. Charts 8 and 9 compare important metrics of exclusivity between Ferrari and its competitors.

## Trends

Some trends that are shifting the luxury automotive industry are:

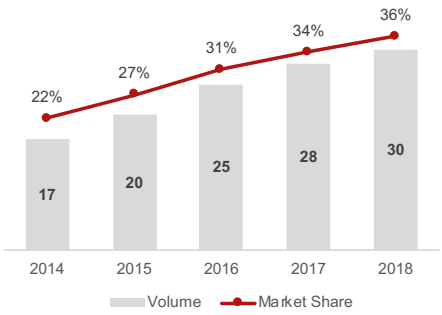
**1) Buyers are getting younger**. The automotive industry is characterised by being slow to change. Cars take years to design and develop, and the models that are now rolling out of factories begun their life a decade ago in the drawing boards. With this demographic shift, OEMs must become nimbler and take greater risks to remain relevant. The age of a luxury car customer is dependent on the region being analysed and is expected to decrease (Chart 10). For example, in the UK, Europe, and Japan, a typical supercar buyer will be around their 50's while in California, it falls to around 35. In China, this shift is even more felt since a luxury car costumer can be as young as 20[4].

**2) Growing proportion of female buyers**. Ferrari estimates that the female segment accounts for less than 5% of its sales. At Aston Martin, the figure is 8%, nonetheless higher than it was a decade ago, although still low. Regarding McLaren, it estimates its sales to women are around 15% though it thinks the proportion of female drivers is much bigger than the statistics reflect[5]. However, in China, the female segment is responsible for 50% of purchases of luxury cars, mainly driven by the GT class. The number of wealthy female consumers is growing. Aston Martin estimates a potential market composed of 14,000 female buyers valued at $30M or more in the US and China alone[4].

**3) Rising SUV and GT markets**. SUV's popularity has been growing worldwide (Chart 11). A third of cars sold in Europe are now SUVs[6]. Some 60% of

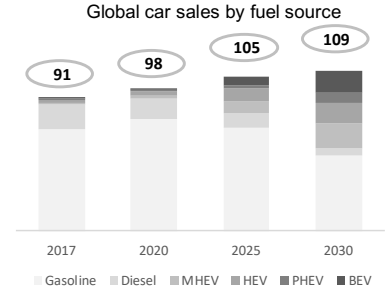
[4] Financial Times. 2019. "Luxury car makers are battling to cater to the changing needs of the super-rich". Accessed January 1. https://www.ft.com/content/e81102b2-bf2e-11e9-9381-78bab8a70848
[5] To calculate this statistic, companies look to the legal name under the vehicle title, which in many cases has the name of the male.
[6] Financial Times. 2019. "Europe has a problem with its SUV habit". Accessed January 1. https://www.ft.com/content/2967c9e2-ffc3-11e9-b7bc-f3fa4e77dd47.

**Chart 11:**
Global SUV sales volume and market share
(€ million, 2014-2018)



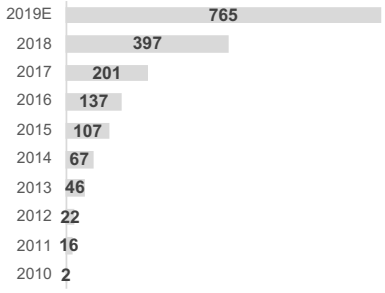

Source: JATO.com

**Chart 12:**
Global car sales by fuel source



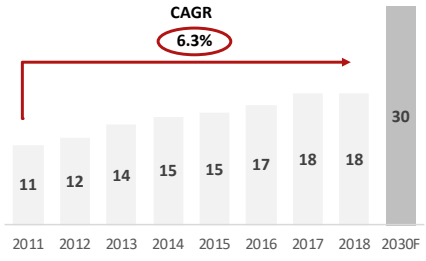

Source: BGC

**Chart 13:**
Global electric vehicle units sold
(thousands)




Source: JATO.com

**Chart 14:**
Number of HNWI evolution
(million, 2011-2018)




Source: Capgemini Word Wealth Report 2019

Lamborghini's sales in the first half of 2019 were SUVs[4]. Their elevated seats make it more comfortable to climb, and it gives drivers a greater sense of confidence, which is connected with wider visibility and security feeling due to the car size.

**4) Electric and hybrid vehicles**. New regulation regarding greenhouse gas emissions imposed worldwide contributed to OEM's to overweight both their hybrid and EV sales (Charts 12 and 13) to avoid heavy fines. These measures place tension in car manufacturers since it takes several years or even a decade from the moment a car is first conceptualized until it reaches the market.

Far-reaching changes and huge investments will be required for European nations to comply with the Paris deal and cut emissions net zero[7] by 2050. More than 1 million[8] electric or plug-in hybrid vehicles are expected to be sold across Europe in 2020, which is four times higher than sales in 2018. We are also witnessing a shift in China towards adopting environmentally conscious cars. China developed an industrial policy known as "Made in China 2025"[9], where it plans to become global leaders and self-sufficient in the production of electric vehicles[10]. China introduced a preferential vehicle licensing program for consumers to start adopting EV cars. In at least six[11] Chinese cities, EV buyers can get license plates for free without having to wait. These centres account for 70%**Error! Bookmark not defined.** of domestic EV purchases. Moving on to the west, the US is also adopting EV's, currently ranking as the third-largest electric vehicle market with their sales topping at 2 million[12] in 2018, representing an increase of 70% from 2017. The main factors that are driving growth in the US EV's market are fiscal incentives, infrastructure buildout, high occupancy vehicle lane access, and parking incentives[12].

**5) Growing number of high net worth individuals**. The number of HNWI in the world (people with over $1 million in investable assets) is predicted to climb from 18 million in 2018 to 30 million[4] by 2030 (Chart 14), which is likely to alter the profile of the supercar customer base.

While not only buyers are getting younger, but also current luxury consumers are becoming more eco-friendly, it contributes towards luxury car manufacturers to start adopting and developing hybrid and electric technologies. Ferrari disclosed

[7] The Guardian. 2019. "Proposed EU-wide 'climate law' would set net-zero carbon target by 2050". Accessed January 2. https://www.theguardian.com/world/2019/nov/29/first-eu-wide-climate-law-to-set-net-zero-carbon-target-by-2050.
[8] Financial Times. 2019. "EU electric car sales to pass 1m next year in industry CO2 drive". Accessed January 2. https://www.ft.com/content/6aa6117c-d0b4-11e9-99a4-b5ded7a7fe3f.
[9] South China Morning Post. 2018. "'Made in China 2025': world's biggest auto market wants to be the most powerful maker of electric cars". Accessed January 2. https://www.scmp.com/business/china-business/article/2169698/made-china-2025-worlds-biggest-auto-market-wants-be-most.
[10] Nikkei Asian Review. 2019. "'Made in China 2025' forges ahead with EV dominance in sight". Accessed January 2.https://asia.nikkei.com/Business/China-tech/Made-in-China-2025-forges-ahead-with-EV-dominance-in-sight?fbclid=IwAR0UeKFQ_2MwpJHH-GQtDFRz-.nGafm82XJzY31_HNHsQX_1bQVEjrGRN96Y
[11] Financial Times. 2017. "Subsidies help China sell the most electric cars". Accessed January 2. https://www.ft.com/content/18afe28e-a1d2-11e7-8d56-98a09be71849.
[12] ICCT. 2019. "The surge of electric vehicles in United States cities". Accessed January 2. https://theicct.org/sites/default/files/publications/ICCT_EV_surge_US_cities_20190610.pdf.

plans to start employing cleaner energy solutions on their car models in the years to come. Nova Research Team has a strong belief that this scenario will materialize and will affect the product mix and its implications.

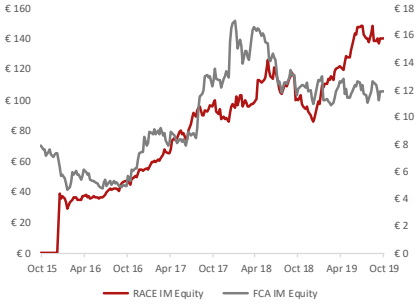
Since the proportion of female buyers will increase, it will also impact the future product mix. This class of buyer prefers SUV's and GT cars. In the valuation, Nova Research Team considers these factors since it increases the impact of the GT class in the product offering mainly driven by the introduction of Ferrari's first SUV (*Purosangue*) and the new V6 category of cars. Lastly, the pool of possible Ferrari clients will increase in the future. This growth is driven by the increase of HNWI globally and the female market segment that started having their tastes incorporated in luxury cars. Even though Ferrari does not intend to satisfy all the demand, Nova Research Team confidently presumes, in the future, Ferrari will have the right market conditions to increase their supply, as it did historically. Hence, it will impact the forecast of future global supply of automobiles, without compromising their low volume strategy.

# Company overview

Ferrari is an Italian luxury sports car manufacturer based in Maranello, Italy. It is among the world's leading luxury brands focused on developing and commercializing the world's most exclusive luxury cars. The Ferrari brand epitomises innovation, state-of-the-art sporting performance, engineering heritage, and exclusivity. To achieve this, Ferrari pursues a low volume production strategy coupled with long delivery waitlists and premium pricing to maintain a reputation for exclusivity and scarcity.

## IPO and Spin-off

**Chart 15:**
Weekly share prices Ferrari versus Fiat Chrysler (€, 2015-2019)




Source: Bloomberg

On October 2014, FCA[13] announced it would separate the Ferrari business from the Group. To that end, Ferrari N.V. was established as the new holding company of the Ferrari group. Later, there was an initial public offering and listing of the common shares of Ferrari N.V. on the New York Stock Exchange under the symbol "RACE". Subsequently, Ferrari was listed on Borsa Italiana (Chart 15).

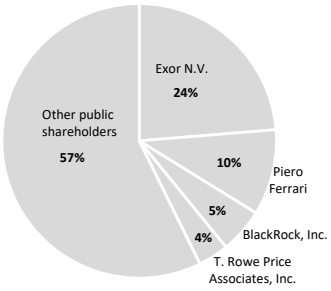
Many reasons lead companies to spin-off part of their business. Still, such a decision ultimately means the management team believes a conglomerate discount is being applied and the sum of each firm separately exceeds the value of the firm as a whole. As a stand-alone company, Ferrari gets operational independence. Also, under FCA's wing, Ferrari was being valued at broader

[13] Fiat Chrysler Automobiles

automotive industry multiples. These are far lower than luxury industry multiples, which share more similarities with Ferrari than most automotive manufacturers. Nevertheless, with the separation, Ferrari loses the safety net of FCA's more abundant financial resources, which are of massive importance in planning for product launches and capital spending over time. We are not concerned with this issue for several reasons. For instance, Ferrari has very high operating margins, sustainable demand for its products, strong competitive advantages and a clear strategic plan that we believe will allow the company to continue its high growth trajectory, all of which will be developed in detail throughout this report.

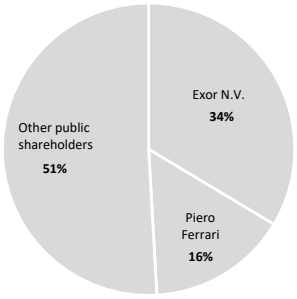
## Shareholder structure

**Chart 16:**
Shareholder structure
(common shares)



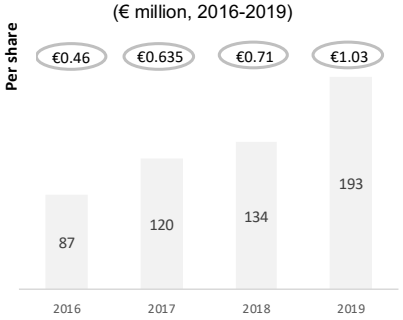

Source: Ferrari Annual Report 2018

**Chart 17:**
Shareholder structure
(special voting shares)




Source: Ferrari Annual Report 2018

**Chart 18:**
Dividend and cash distribution
(€ million, 2016-2019)




Source: Ferrari Annual Report 2018, Ferrari Interim Report September 30 2019

(Chart 16) Exor N.V. is Ferrari's largest shareholder, owning 23.7% of the company and is one of Europe's leading diversified holding companies. It invests in companies from different sectors, mainly in Europe and in the United States. Its present principal business activity is to purchase, administer, and dispose of equity interests in public and private entities. Pierro Ferrari is the son of Enzo Ferrari, the company's founder, and is the owner of 10.1% of Ferrari N.V.'s share capital. BlackRock is the world's largest asset manager. It purchased a stake of 5.3% of Ferrari. Finally, T. Rowe Price Group, Inc. is an American publicly owned global asset management firm and is the fourth largest Ferrari N.V. shareholder. We conclude that Ferrari's principal shareholders pursue long-term investments and are mostly concentrated in Europe.

Shareholders can obtain special voting shares (Chart 17) through the loyalty voting structure. Its purpose is to stimulate stability of the company's shareholder pool and reward long-term investors. They may apply to participate in the loyalty voting program by registering their common shares in the loyalty share register and holding them for three years. Each special voting share entitles the holder to exercise one vote at the shareholders meeting. The special voting shares have only immaterial economic entitlements and, as a result, don't impact the company's earnings per share calculation. Besides, special voting shares cannot be sold or transferred. If the holder of such shares wishes to liquidate his investment, he must de-register his shares to convert them back to common shares[3].

Ferrari gives money back to shareholders in the form of dividends, cash distributions (Chart 18), and share buybacks. In May 2019, Ferrari distributed a dividend of €1.03 per common share, totaling approximately €194 million[14]. As for the share buybacks, the company has been deploying a share repurchase

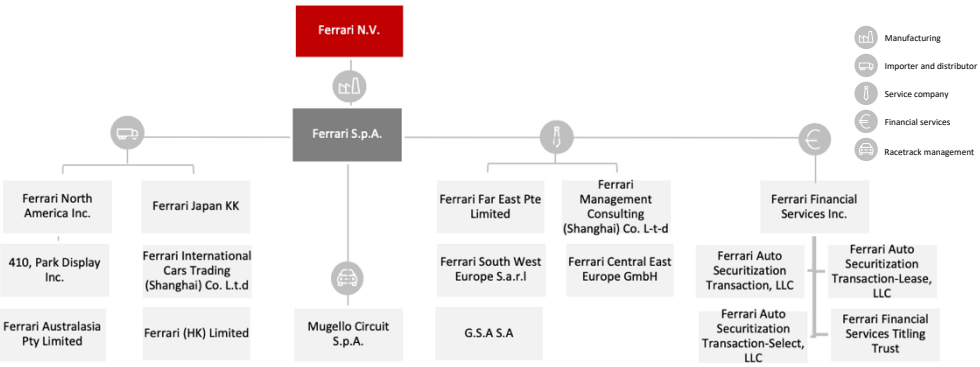
[14] Ferrari interim report at and for the three and nine months ended September 30, 2019. Accessed January 2. https://corporate.ferrari.com/en/interim-report-and-three-and-nine-months-ended-september-30-2019.

program since 2018, which involved the repurchase of 2,769,155 shares (approximately €150 million)during fiscal 2019[15]. The company already announced its intention to continue pursuing this program at least until the first half of 2020[16].

## Group structure

Ferrari N.V is an SPV[17] created for the separation between FCA and Ferrari. It is the owner of Ferrari S.p.A, which owns all of the Group's subsidiaries, ranging from service companies to financial services, operating all over the world. Ferrari N.V is the indirect owner of 100% of all subsidiaries except Ferrari International Cars Trading (Shanghai) Co. L.t.d., of which it owns 80% (Figure 1).

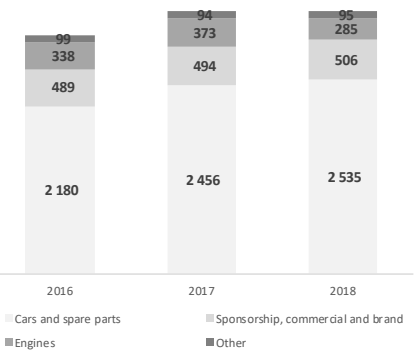
**Figure 1:**
Ferrari N.V. subsidiaries




Source: Ferrari Annual Report 2018

Nowadays, Ferrari operates under one reportable business segment, with four revenue streams (Chart 19): cars and spare parts; sponsorship, commercial and brand; engine and other. Cars and spare parts have historically been the main focus of Ferrari's business, representing 74% of revenues in 2018, followed by sponsorship, commercial and brand, which represented 15%. The third most significant segment is engines, responsible for 10% of revenue generation, and lastly other revenues represented 3%.

**Chart 19:**
Revenue streams evolution
(€ million, 2016-2018)




Source: Ferrari Annual Report 2018

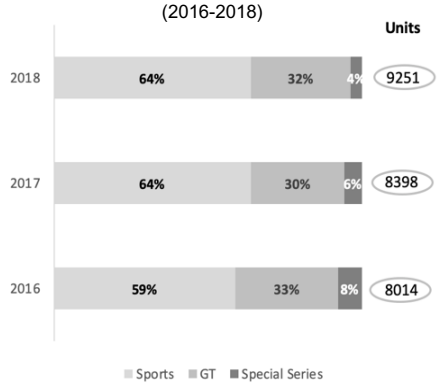
**1) Cars and spare parts.** Ferrari's luxury car offering comprises four main pillars: Sports range, which favor performance over comfort; GT range, that are characterized by more refined interiors with a higher focus on comfort and quality of life on-board; Special series, which can be limited in time or volume and are based on range models but introduce novel product concepts, and Icona,

[15] Ferrari 2019 Buyback program. Accessed January 2. https://corporate.ferrari.com/sites/ferrari15ipo/files/2019_buyback_program_first_tranche_chart_01.07.2019_final.pdf.https://corporate.ferrari.com/sites/ferrari15ipo/files/2019_buyback_program_chart_14.11.2019_-_second_tranche.pdf. https://corporate.ferrari.com/sites/ferrari15ipo/files/2019-2020_buyback_chart_-third_tranche.pdf.

[16] Ferrari 2019 Buyback program. Accessed January 2. https://corporate.ferrari.com/en/ferrari-nv-completion-second-tranche-disclosed-multi-year-share-repurchase-program-and-announcement.

[17] Special purpose vehicle

**Chart 20:**
Ferrari car shipments breakdown
(2016-2018)




Source: Ferrari Annual Report 2018

introduced in late 2018, a unique concept which takes inspiration from the iconic cars of Ferrari's history and reinterprets them in a modern fashion[3].

Historically, sports cars represent the most significant percentage of units sold (Chart 20). However, in recent years GT cars have been gaining market share within Ferrari's offering, explained by the changing consumer preferences towards more comfortable and practical cars, especially among female consumers.

In addition to these ranges, Ferrari also produces limited edition hypercars. These are often the forerunners of technological innovations for future range models[3]. The company also launches very limited-edition cars (*fuori serie*), that feature a completely unique design and specifications. Ferrari from time to time also produces one-off models. While based on current range models, these cars reflect the exact exterior and interior design specifications requested by the clients and are produced as a single, unique car[3]. Finally, the company also manufactures and sells track cars, for use only in racetracks.

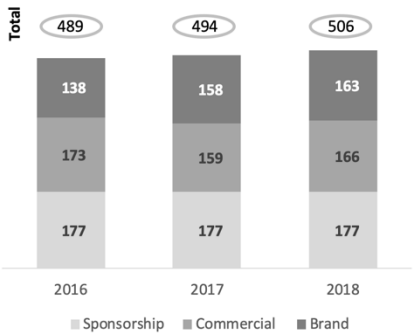
**Table 1:**
Luxury car manufacturers product and services offering

| | Limited editions | One-off | Personalization |
|---|---|---|---|
| Ferrari | ✓ | ✓ | ✓ |
| Lamborghini | ✓ | ✗ | ✓ |
| Rolls-Royce | ✓ | ✓ | ✓ |
| Bentley | ✓ | ✗ | ✓ |
| Aston Martin | ✓ | ✓ | ✓ |

Source: Company websites

Limited edition cars are a crucial part of Ferrari's business as they appeal to the most elite clients and are an essential weapon in maintaining client relationships. Ferrari even takes this quest for the exclusive to the extra level with its one-off models and its tailor-made program. Any average millionaire or billionaire can buy a Ferrari, but only a select group gets the privilege of purchasing a fully customized one. However, Ferrari is not the only player to offer limited edition supercars and personalization services. Luxury automotive peers Lamborghini, Rolls Royce, Bentley, and Aston Martin also have a similar offering. As for one of a kind vehicles, Ferrari is a pioneer in this segment and the manufacturer with the most well-developed program, followed by Rolls-Royce and Aston Martin (Table 1).

**Chart 21:**
Sponsorship, commercial and brand
(€ million, 2016-2018)

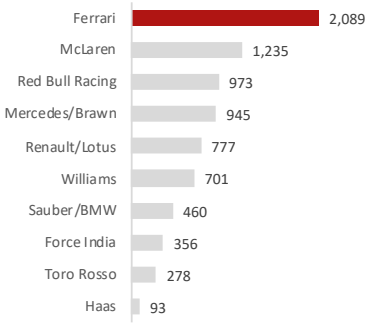



Source: Ferrari Annual Report 2018, Nova Research team

**2) Sponsorship, Commercial and Brand** (Chart 21)**.** The company's main marketing initiative is the participation in the Formula 1 World Championship with its team, Scuderia Ferrari. The participation in this competition attracts significant sponsorships. Also, Scuderia Ferrari brings in revenue thanks to the cash prizes associated with the participation in competitions. Other brand development activities include licensing contracts with selected partners, retail activities through a chain of franchised or directly managed stores, licensed theme parks, and the development of a line of apparel and accessories sold exclusively in monobrand stores and on Ferrari's website[3].

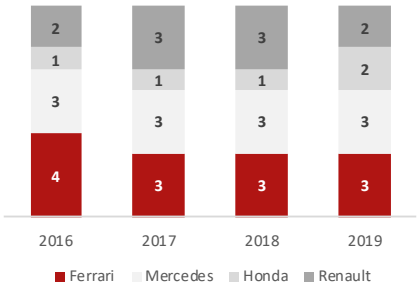
Ferrari faces a different set of competitors in F1 than in its road car business. To this day, Ferrari has the most profitable sponsorship deals (Chart 22), even though it has not won a title since 2008. As for commercial revenues, Ferrari is also the

**Chart 22:**
F1 total team sponsorships
($ million, 2009-2018)




Source: sponsors.formulamoney.com

**Chart 23:**
Engine suppliers of Top 10 F1 teams
(2016-2019)




Source: F1 team websites
Notes: Includes engines of own teams. Teams included: Mercedes, Ferrari, Williams, Red Bull, Force India, Toro Rosso, Renault, McLaren, Haas and Sauber.

highest paid, primarily thanks to the long-standing team payment of around €60 million, attributed only to Ferrari.

As for licensing contracts and retail activities, other luxury car manufacturers besides Ferrari are no strangers to such endeavors. Lamborghini, Bentley, and Aston Martin also offer a wide range of products in the same categories as Ferrari. Regarding theme parks, Ferrari is a pioneer. No other car manufacturer, luxury or not, has a dedicated flagship theme park.

**3) Engines.** This segment captures the supply of engines to Maserati and the rental of engines to Formula 1 race teams, other than Scuderia Ferrari. Ferrari has a multi-year arrangement with Maserati to provide V6 and V8 engines up to 2020 and 2021, respectively. As for F1, Ferrari currently rents engines to two teams.

Supplying engines to other car manufacturers is not a common practice among luxury car manufacturers. Ferrari is currently the only one pursuing this business opportunity. Regarding the rental of engines to F1 teams, its main competitors are Honda, Mercedes, and Renault, which share the supply of engines to F1's top 10 teams (Chart 23).

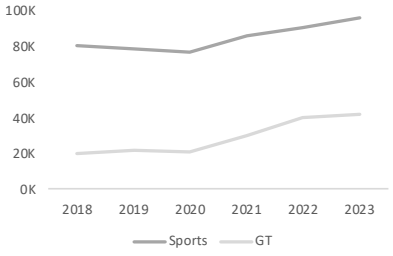
**4) Other.** Primarily includes the operations of Ferrari financial services and from the management of the Mugello racetrack. The Mugello racing circuit, is rented by Ferrari to racing events organizers. As for its financial services, Ferrari offers retail client financing for the purchase of cars and dealer financing through Ferrari Financial Services ("FFS"). Having a financial services unit is a common practice under auto manufacturers.

## Strategy

***A product range more complete than even before…***

Ferrari plans to introduce 15 new models in the 2019-2022 period[3], which is unprecedented for Ferrari over a similar period. In the GT range, the company is developing its first luxury SUV, the *Purosangue*, and a new line of cars powered by V6 engines[3].

**Chart 24:**
Global sports, GT mid-engine growth
(units)




Source: HIS Markit Global Automotive Outlook, 2018

While Ferrari is broadening its product portfolio, we expect that sports cars will continue to be Ferrari's main business, but that GT cars will continuously capture more and more demand, as observed in the broader industry (Chart 24), especially with the introduction of the SUV. While such a high number of new launches in the upcoming years implies a higher production level, we believe Ferrari will not compromise its low-volume strategy.

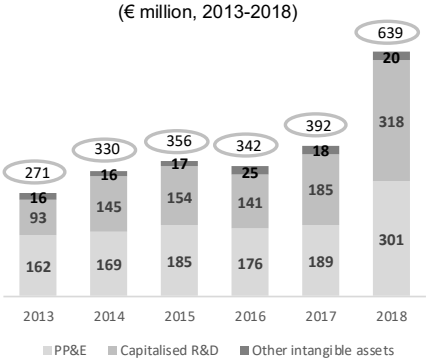
As for limited edition cars, sales in this segment are expected to increase as the ultra-wealthy value the most exclusive products and are willing to spend more money on a unique item.

Coupled with the introduction of a broad range of new models, Ferrari intends to introduce new models more frequently. Currently, the average production lifecycle for sport and GT models is from 4 to 5 years and less for special series. While we expect this decision to increase revenues, it will also increase R&D costs, since developing more models implies deploying far more development resources.

In addition, car prices are expected to continue to rise, both to compensate for costs of added technology such as expensive hybrid systems, but also because the affluence of Ferrari's customer base keeps on growing.

To be consistent with consumer preferences and regulatory requirements regarding emissions, Ferrari has announced it will gradually but rapidly expand the use of hybrid technology in its road cars. The CEO plans to have hybridization across at least 60% of Ferrari's range cars by 2022[18], including a 100% hybrid sports car range by 2021[19]. Considering the already debuted and expected models for the next five years, we believe that the CEO's plans are optimistic, and will most likely fall short. Nevertheless, we expect a non-material impact on revenues assuming that upcoming combustion engine vehicles will still be sought-after by Ferrari clients and that demand will not be an issue. Still, we do expect the percentage of hybrid models to increase with time, which will likely carry lower margins than current models despite the higher retail price, due to the higher cost of manufacturing, especially in the short-term.

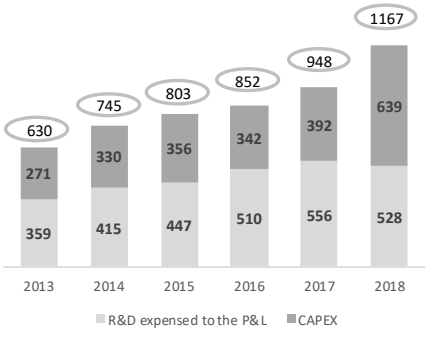
**Chart 25:**
Gross CAPEX
(€ million, 2013-2018)




Source: Ferrari Annual Report 2018

The company is deploying considerable resources for the development of hybrid powertrains, as made clear by the company's CAPEX evolution (Charts 25 and 26), particularly in 2018. As for a full electric battery, Mr. Camilleri, the CEO, said it should arrive between 2025 and 2030[19], with the precise date depending on the speed of technological advances. We do not expect Ferrari to debut a fully electric vehicle before 2030.

**Chart 26:**
Expensed R&D and CAPEX
(€ million, 2013-2018)




Source: Ferrari Annual Report 2018

As for branding activities, the CEO's plans for the company include terminating half of the licensing agreements that do not share the brand's values[20]. Besides, he plans to enhance the brand through new apparel and accessory collections, entertainment offers, luxury products and services for clients. They include an agreement with Italian fashion house Giorgio Armani, the opening of a restaurant with star chef Massimo Bottura and a theme park in Spain. We believe that this strategy has the main objective of positioning Ferrari's licensing and retail activities

[18] Financial Times. 2018. "Ferrari unveils 'ambitious' plan to secure future of brand". Accessed January 2. https://www.ft.com/content/b457a7f4-bb34-11e8-8274-55b72926558f.
[19] The Wall Street Journal. 2019. "Ferrari CEO Races to Build Company's Brand". Accessed January 2. https://www.wsj.com/articles/ferrari-ceo-races-to-build-companys-brand-11573300801.
[20] Bloomberg. 2019. "Ferrari Brings in Armani for Italian Boost to Its Luxury Brand". Accessed January 2. https://www.bloomberg.com/news/articles/2019-11-04/ferrari-poised-to-unveil-plan-for-expansion-in-luxury-products.

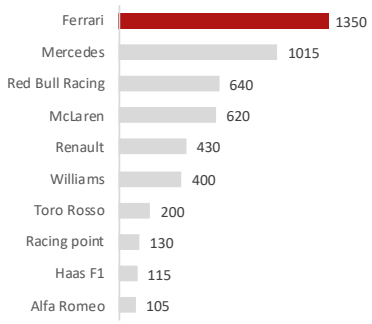
in the same luxury level as its cars, which is currently not the case. We expect this will have a positive impact on Ferrari's revenues in this segment.

## Competitive advantages

**1) Brand value**. Ferrari was considered the world's most powerful brand in 2018 by Brand Finance[21]. This is the result Ferrari's innovation, state-of-the-art sporting performance, engineering heritage, and exclusivity. Over the years, the company has capitalized the power of the Prancing Horse in other endeavors. It has been selectively expanding its brand presence in diverse lifestyle categories consistent with its image. Which in return enriches the brand experience of its loyal clients and Ferrari enthusiasts.

**2) Formula 1.** Ferrari's name, history and image are closely associated with its Formula 1 racing team, Scuderia Ferrari, the most successful team in F1 history. From the inaugural year of F1 in 1950 through the present, Scuderia Ferrari has won 235 Grand Prix races, 16 Constructor World titles, and 15 Drivers' World titles[22]. Although Ferrari's most recent F1 world title was in 2008, it is still the most valuable competing team (Chart 27). Its participation in F1 is critical to the brand among enthusiasts, customers, and the general public. Ferrari's racing origins are at the core of the company's excellence, innovation, and unique style. Developing race cars is an essential source of technological innovation that is later deployed on Ferrari's road cars.

**Chart 27:**
Formula One's most valuable teams
(€ million, 2019)




Source: Forbes
Note: All figures are Forbes estimates based on financial documents, reports and interviews with industry experts

**3) Loyalty.** When clients purchase a Ferrari, they are invited to become part of an select group. They can participate in a full calendar of events which foster their loyalty to the brand. Ferrari has been exceptional is nurturing a relationship with its current clients. In 2018, more than 65%**Error! Bookmark not defined.** of the company's new cars were sold to Ferrari owners, while 41% of clients own more than one Ferrari[3].

Another promoter of loyalty is Ferrari's resilience in the value of their cars after a period of ownership. It significantly exceeds that of any other brand in the luxury car segment[22]. This is a key competitive advantage since a higher residual value lowers the cost to switch to a new model, which promotes repeated purchases.

***"If you look in the market and you ask, is Ferrari the fastest car? The answer is no. If you ask me if Ferrari is the car with the highest horsepower, the answer is no. Is it relevant? We don't believe so."***

***Enrico Galliera***
***(Commercial and Marketing Director)***

**4) Driving emotions.** As Enrico Galliera explained[23], Ferrari does not manufacture the fastest or most powerful cars in the market. However, its balance of power and drivability to a unique driving experience. At Ferrari they call it "emotion to drive".

[21] Brand Finance. 2018. "Ferrari – The World's Most Powerful Brand". Accessed January 2. https://brandfinance.com/news/ferrari--the-worlds-most-powerful-brand/.
[22] Ferrari Sustainability Report 2018. Accessed January 2. https://corporate.ferrari.com/en/2018-sustainability-report.
[23] Arabian Business. 2016. "Why Ferrari is still the world's most wanted sports car". Accessed January 2. https://www.arabianbusiness.com/why-ferrari-is-still-world-s-most-wanted-sports-car-635624.html.

What differs Ferrari from other luxury sports car manufacturers is the passion, the feeling that collectors and enthusiasts have for this iconic brand.

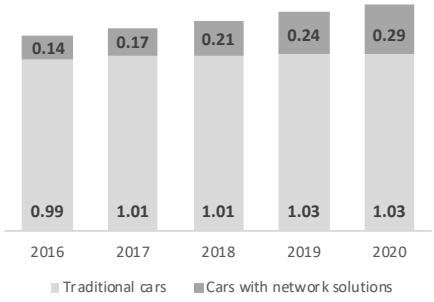
## Risks

After a thorough analysis, we identified the following risks affecting the broader automotive industry and solely Ferrari as worthy of addressing in this report:

**1) Gasoline prices**. This is something we believe will not affect Ferrari since HNWI do not take into consideration this variable before buying a luxury car.

**2) Autonomous driving**. As previously mentioned, Ferrari has no plans to manufacture self-driving cars. However, historically it has already incorporated certain autonomous driving technologies and it plans to continue to do so in response to regulatory developments and customer preferences.

**Chart 28:**
Inter-connected cars are on the rise
(billion units)

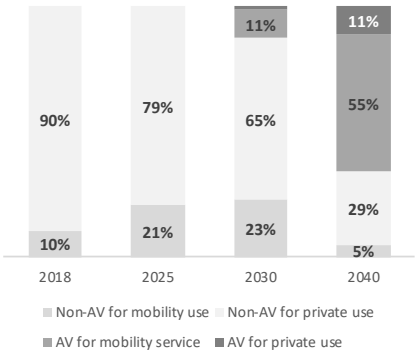



Source: McKinsey & Company

For years now, automakers have developed their strategies based on the idea that autonomous vehicles' reality would soon strike the market. OEMs have invested billions[24] of dollars in designing cars for CASE[25] mobility. Currently, connected cars are already omnipresent (Chart 28), and EVs are gaining ground among auto buyers. Nonetheless, autonomous and shared vehicles are still a futuristic bet for which experts forecast a rapid and widespread adoption[25] once commercialized.

Five years ago, analysts forecasted self-driving cars would capture approximately 80% market share by 2035[24]. More recently, experts acknowledged that it could take decades before AV's are seen on roads[24]. Furthermore, they may never be able to drive without human assistance in challenging conditions such as bad weather, crowded or construction areas[24].

**Chart 29:**
Estimated passenger kilometers travelled
by vehicle type

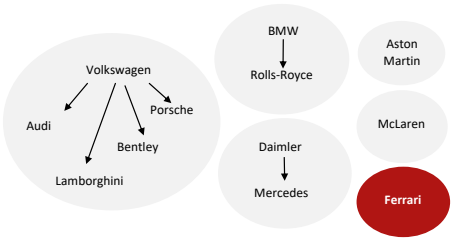



Source: McKinsey & Company

Nova Research Team's view on this risk is that the scenario of one day having autonomous cars is very far in the distance, and according to experts it might not become a reality. Moreover, there is a growing recognition that getting the self-driving algorithms right is merely an entry ticket for the much bigger challenge of commercialization, which will require government approval, public trust, brand marketing, and the ability to manufacture at large scale[26]. Therefore, we believe that in the next decade this risk should not impact Ferrari. However, in perpetuity, it can destroy its competitive advantages since if cars are no longer driven by humans (Chart 29), Ferrari loses its ability of conveying a unique driving experience.

[24] PwC. 2019. "Automotive trends 2019". Accessed January 2. https://www.pwc.com/gx/en/ceo-survey/2019/Theme-assets/reports/automotive-trends-report.pdf.
[25] Connected, Autonomous, Shared and Electrified
[26] Financial Times. 2019. Driverless car groups look past the engineering challenge". Accessed January 2. https://www.ft.com/content/dead3eb0-0bba-11ea-bb52-34c8d9dc6d84.

**Figure 2:**
Luxury performance car market players

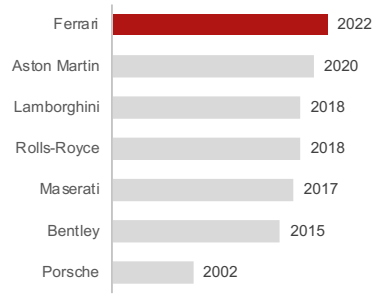



Source: Nova Research Team

**3) Stand-alone position of Ferrari in the luxury automotive industry**. Ferrari competes with both international stand-alone luxury manufacturers and mass-market automakers that own and operate well-known brands of high-quality supercars (Figure 2). The latter may have greater financial resources and bargaining power with suppliers.

Currently, the automotive industry is hot in M&A activity which can be interpreted as the blueprint firms carry out to face rising costs related with trends in the industry. Peugeot's CEO points out for an increasingly urged industry consolidation as a way to meet the vast investment expenses involved in developing new technologies to meet both emission targets and client's higher demands[27]. In light of future demands, Ferrari might burden a competitive disadvantage and in an extreme case partner up again with a larger automotive group. Developing and applying new automotive technologies is costly and may become even more so in the future as technology advances and competition in the industry increases[3].

**Chart 30:**
SUV market launch year by brand




Source: Nova Research Team

**4) SUV market entrance for Ferrari is planned to occur in 2022**. Competitors have already introduced their models (Chart 30) and established themselves in the market. Even though there is an increasing tendency for selling SUV's, new environmental regulations and eco-clients might annihilate most of SUV's sales in the near future. SUV's have contributed to rising carbon emissions[6]. In addition, it consumes a quarter more energy on average than medium-sized cars[6]. They are among the largest contributors to a rise in global emissions since 2010[6]. Furthermore, by introducing an SUV Ferrari will increase units sold while not cannibalizing other models' sales. Therefore, it might ruin its key appeal of exclusivity and the sense of luxury. Consequently, its low volume strategy might be at risk, which prevents Ferrari to charge the usual high-end prices that customers are accustomed to pay.

Nova Research Team believes that competing in the SUV market presents as a good opportunity for Ferrari to increase and diversify its revenue streams. In addition, since the *Purosangue* will offer a hybrid alternative, we do believe its sales will not be affected by eco-clients demands. Moreover, since the SUV market is projected to keep increasing in revenue and market share, we trust it is not too late for Ferrari to enter the game. Lastly, Nova Research Team strongly believes that Ferrari's low volume strategy will not be affected by an increase in units shipped driven by the introduction of the SUV, since in the eyes of Ferrari

[27] Financial Times. 2019. "Peugeot boss points to perils of missing CO2 targets". Accessed January 2. https://www.ft.com/content/b4a254e4-b20e-11e9-8cb2-799a3a8cf37b.

increasing units produced reveals an increase in demand and does not necessarily destroy the aura of exclusivity if it is done in a sustainable way.

**5) Small vehicle manufacturer (SVM)**. This risk is more deeply approached in the individual part where Nova Research Team tries to breakdown by region and estimate in further detail the implications for Ferrari of losing the SVM status.

# Valuation

In this report, Ferrari's core business is analyzed separately from its non-core business activities such as employee benefits and investments in financial assets.

Ferrari's financial statements were analyzed from 2016 onwards because that is the year the separation from FCA is finalized and that Ferrari is operating "normally". Nevertheless, for some items, we went further back in time to better understand its evolution.

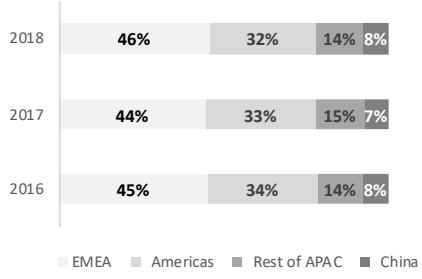
## Ferrari's Revenues

- Cars and spare parts

This revenue stream includes not only the proceeds from the sale of cars but also of spare parts and servicing. Since Ferrari doesn't provide a breakdown of these three sub-segments, we looked at industry peer Aston Martin and concluded that the breakdown should be: 92.8% for cars, 6.0% for spare parts, and 1.2% for servicing. As such, we applied these allocation rates to the historical revenues from cars and spare parts before starting the forecasting process. Handling the historical data was a necessary step to forecast spare parts and servicing based on car revenues.

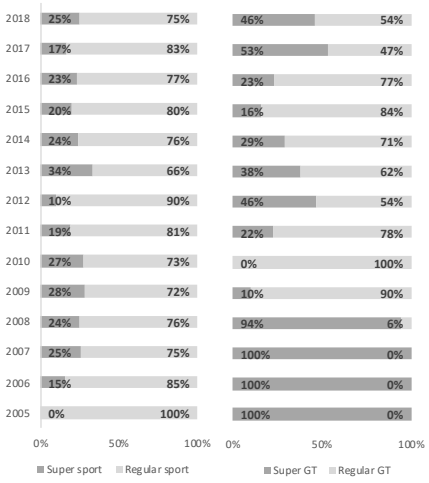
Nova Research Team decided not to breakdown revenues in geographical regions because Ferrari's business has historically been very concentrated in Europe (Chart 31), and even though we recognize that emerging markets are relevant, we do not expect geographical operations to shift significantly.

**Chart 31:**
Geographical operations breakdown




Source: Ferrari Annual Report 2018

**Chart 32:**
Historical super versus regular cars breakdown in sports and GT ranges, in Europe (2005-2018)




Source: JATO.com

**Product mix**

Historically, Ferrari's sports range has been rather consistent. It is comprised of regular sports cars (in coupe and spider versions) and "super sports" cars, that are more expensive and powerful versions of the former. Historically, Ferrari's regular sports cars represented 79% of sports units shipped, and the super sports represent 21%[28] (Chart 32), a breakdown that we assume will remain constant.

[28] This analysis was conducted using JATO.com figures for units shipped of each model in Europe. We assume that the same super (expensive) versus regular (non-expensive) breakdown of units shipped applies for the remaining geographies in which Ferrari operates.

**Table 2:**
Hybridization across future models

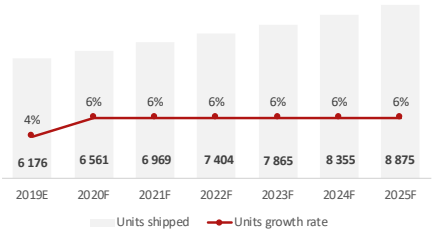
| | Future Models | Start | End | Hybrid |
|---|---|---|---|---|
| | **Sports** | | | |
| Super sport (Expensive) | 812 Superfast | 2017 | 2022 | |
| | 812 GTS | 2020 | 2022 | |
| | SF90 Stradale | 2020 | 2025 | (H) |
| | SF90 Stradale Spider | 2021 | 2025 | (H) |
| | Sucessor 812 Superfast | 2022 | 2027 | (H) |
| Sport (Non-expensive) | 488 GTB | 2015 | 2019 | |
| | 488 GTB Spider | 2015 | 2019 | |
| | F8 Tributo | 2019 | 2023 | |
| | F8 Tributo Spider | 2020 | 2023 | |
| | Sucessor of F8 Tributo | 2023 | 2027 | (H) |
| | Sucessor of F8 Tributo Spider | 2024 | 2027 | (H) |
| | **GT** | | | |
| GT (Non-expensive) | V6 | 2021 | 2024 | (H) |
| | Sucessor of V6 | 2024 | 2027 | (H) |
| | Portofino | 2018 | 2022 | |
| | Sucessor Portofino | 2022 | 2025 | (H) |
| | Purosangue | 2022 | 2025 | (%H) |
| Super GT (Expensive) | GTC4Lusso | 2016 | 2020 | |
| | GTC4Lusso T | 2017 | 2020 | |
| | Ferrari Roma | 2020 | 2023 | |
| | Ferrari Roma Spider | 2021 | 2023 | |
| | Sucessor Ferrari Roma | 2023 | 2026 | (H) |

Source: Nova Investment Team

**Chart 33:**
Historical units shipped and units CAGR (2006-2018)

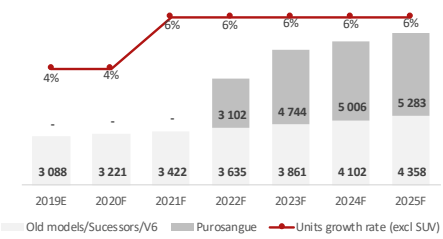

Source: FCA Annual Report (2006-2015), Ferrari Annual Report (2016-2018)

**Chart 34:**
Sports range units shipped per year (2019E-2025F)




Source: Nova Research Team

**Chart 35:**
GT range units shipped per year (2019E-2025F)




Source: Nova Research Team

Typically, once a new version of a model is introduced, the prior version is discontinued. Besides, a spider version is launched the same or following year as the coupe version, and both are discontinued at the same time. We assume that this process will continue. A significant change will occur in the sports range with the introduction of the SF90 Stradale, the company's first series-production hybrid car, in 2020. It will contribute towards an increase in both price and quantities. We also expect the Stradale to have a spider version.

Similar to the sports range, GT cars also display a very consistent lifecycle of its coupe and spider versions, so we also assumed that this trend will continue. Super GT models represented 34% of GT units shipped, and the regular models 66%[28] (Chart 32), a breakdown we assume will remain constant.

Significant changes are expected to occur in the GT segment, thanks to the introduction of a V6 family in 2021 and the *Purosangue* (Ferrari's SUV) in 2022.

Perhaps the most significant change to occur in Ferrari's product mix is the substantial incorporation of hybrid models. We assume that most of the upcoming models not yet announced will have hybrid powertrains (Table 2).

## Quantity

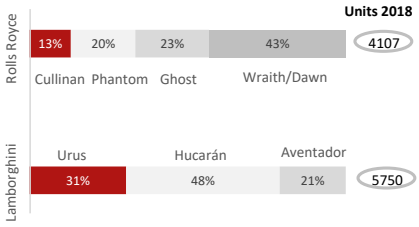
Regarding quantities, we believe forecasting based on past behavior is a fair assumption. As a low volume manufacturer with waitlists of several years, Ferrari has never increased its production levels significantly. We do not expect future annual growth in units shipped to increase by more than what it has in the past (Chart 33), for the existing models and replacements[29]. The historical average of the growth in units shipped is 4.3%. However, in some years, we expect growth in units to be higher, considering that there will be not only replacement models but also completely new lines and models. In these cases, we use the third quartile growth rate in units shipped observed in the same historical period, which is 6.2%.

In the sports range, we expect to observe the average growth rate, 4.3%, in 2019 and the third quartile, 6.2%, from 2020 onwards (Chart 34), fueled by the introduction of the SF90 Stradale.

In the GT range, the *Purosangue* (Ferrari's SUV) was analyzed separately from other models. For the remaining models, we expect to observe the average growth rate of 4.3% in 2019 and 2020. From 2021 onwards, it will grow by the third quartile growth rate, 6.2%, to account for the introduction of the V6 family (Chart 35).

[29] New cars that share the same concept as existing models. For example, the F8 Tributo is a replacement for the 488 GTB.

**Chart 36:**
Lamborghini and Rolls Royce breakdown of units shipped in the first year of SUV sales




Source: Company Annual Reports

**Table 3:**
Forecasted units breakdown between sports and GT ranges and super/regular models

| Ranges | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F |
|---|---|---|---|---|---|---|
| **Sport (% total units** | **67%** | **67%** | **52%** | **48%** | **48%** | **48%** |
| Super Sport | 21% | 21% | 21% | 21% | 21% | 21% |
| Normal Sport | 79% | 79% | 79% | 79% | 79% | 79% |
| **GT (% total units)** | **33%** | **33%** | **48%** | **52%** | **52%** | **52%** |
| Super GT | 34% | 34% | 18% | 15% | 15% | 15% |
| Normal GT | 66% | 66% | 36% | 30% | 30% | 30% |
| Purosangue | 0% | 0% | 46% | 55% | 55% | 55% |

Source: Nova Research Team

**Table 4:**
Percentage of hybrid cars per year, per range

| Hybrid models | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F |
|---|---|---|---|---|---|---|
| Super Sport | 5% | 7% | 7% | 10% | 10% | 10% |
| Normal Sport | 0% | 0% | 0% | 13% | 38% | 38% |
| Super GT | 0% | 0% | 0% | 3% | 8% | 8% |
| Normal GT | 0% | 11% | 11% | 16% | 16% | 16% |
| Purosangue | 0% | 0% | 9% | 12% | 12% | 12% |
| **Total** | **5%** | **18%** | **27%** | **52%** | **83%** | **83%** |

Source: Nova Research Team

***"Is it more exclusive to sell 5,000 than 10,000 cars?" Galleria continues. "I don't think there is a clear answer. If you have the demand for 12,000 cars, 10,000 is very exclusive. If you have the demand for 9,000 cars and you sell 10,000, it's not exclusive. That is the measuring ratio, the number of cars versus the level of demand is what we look very carefully at."***

***Enrico Galliera***
***(commercial and marketing director)***

As for the *Purosangue*, we analyzed the impact of launching an SUV for the first time on peers Lamborghini Urus and Rolls Royce Cullinan (Chart 36). We concluded that in the first year of shipments, the *Purosangue* will account for 22% of total units shipped[30], which will increase by 53% on the second year of shipments. No data is available for the third year as no luxury performance car brand has had an SUV for longer than two years, so for the following years we assume a third quartile growth rate of 6.2% (Chart 35).

Research suggests that the *Purosangue* will be made available in both hybrid and non-hybrid powertrains[31], which the research team believes is a reasonable assumption considering Ferrari's hybridization plans. According to national surveys, in the United States, between 10% and 30% of consumers indicated their preference to consider an EV as their next purchase. In Europe, the reported share of consumers considering EV purchase was higher, at 40% to 60% and in China, it was over 70%[32]. As such, we assume that in each year, 40%[33] of *Purosangue* units shipped will be hybrids.

Considering the total quantities forecasted for sport and GT ranges, the super versus regular breakdown (Tables 3), and the models that will be available each year, we arrive at the hybridization rates per year (Table 4).

The Icona range is a new concept at Ferrari, only two models were introduced so far, and no further launches are expected during the forecasting period. According to research, only 500 units in total will be made[34], of which we assume 100 will be sold in the first year (2019), 250 in the second year, and 150 in the third year.

While pursuing the forecasting method described above, we assume that there will be demand for the quantities forecasted. This is consistent with the expected evolution of HNWI, Ferrari's target consumers, and the new consumer pools attracted to the electrified and SUV models, mentioned in the industry overview.

It is also our conviction that Ferrari will continue to be a sought-after brand by the wealthy, and that it will not be damaged by further increases in units manufactured. The topic of exclusivity was already addressed by the company's commercial and brand director Enrico Galliera[23]. He believes that exclusivity is not a matter of numbers, rather, the numbers are related to the level of demand. In fact, we expect

[30] Where total units=sports range + GT range (including *Purosangue*)
[31] Autocar. 2019. "Ferrari's 2022 rapid luxury SUV detailed by technical boss". Accessed January 2. https://www.autocar.co.uk/car-news/new-cars/ferraris-2022-rapid-luxury-suv-detailed-technical-boss.
[32] McKinsey & Company. 2019. "Making electric vehicles profitable". Accessed January 2. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/making-electric-vehicles-profitable.
[33] $Proportion\ of\ Purosangue\ hybrids = \frac{Average\ of\ Europe\ preference\ (50\%) \times Ferrari\ revenues\ Europe\ 2018}{Ferrari\ revenues\ Europe,USA\ and\ China\ 2018} + \frac{Average\ of\ USA\ preference\ (20\%) \times Ferrari\ revenues\ USA\ 2018}{Ferrari\ revenues\ Europe,USA\ and\ China\ 2018} + \frac{China\ preference\ (70\%) \times Ferrari\ revenues\ China\ 2018}{Ferrari\ revenues\ Europe,USA\ and\ China\ 2018}$
[34] Automotive news Europe. 2018. "Ferrari Monza supercars will earn $755 million in revenue". Accessed January 2. https://europe.autonews.com/article/20181003/ANE/181009875/ferrari-monza-supercars-will-earn-755-million-in-revenue.

demand to increase, as very anticipated products such as a SUV and hybrid/electric vehicles, as previously discussed, will soon be marketed.

**Table 5:**
Forecasted prices per model in sports and GT range

| | Future Models | Price | Hybrid |
|---|---|---|---|
| | **Sports** | | |
| Super sport (Expensive) | 812 Superfast | 292 700 | |
| | 812 GTS | 301 793 | |
| | SF90 Stradale | 461 858 | (H) |
| | SF90 Stradale Spider | 508 791 | (H) |
| | Sucessor 812 Superfast | 357 558 | (H) |
| Sport (Non-expensive) | 488 GTB | 207 623 | |
| | 488 GTB Spider | 230 702 | |
| | F8 Tributo | 212 455 | |
| | F8 Tributo Spider | 234 044 | |
| | Sucessor of F8 Tributo | 255 984 | (H) |
| | Sucessor of F8 Tributo Spider | 281 996 | (H) |
| | **GT** | | |
| GT (Non-expensive) | V6 | 191 442 | (H) |
| | Sucessor of V6 | 193 139 | (H) |
| | Portofino | 165 140 | |
| | Sucessor Portofino | 191 442 | (H) |
| | Purosangue | 262 879 | (%H) |
| Super GT (Expensive) | GTC4Lusso | 245 485 | |
| | GTC4Lusso T | 209 830 | |
| | Ferrari Roma | 246 562 | |
| | Ferrari Roma Spider | 271 617 | |
| | Sucessor Ferrari Roma | 285 833 | (H) |

Source: Nova ResearchTeam

## Price

A detailed analysis of the historical and current sport and GT model prices[35] and its evolution were at the base of our forecast. Future prices for these ranges were forecasted for each model the research team expects Ferrari will launch in the future (Table 5). For replacement models, the price was increased by the rate observed in the past[36]. For convertible models, a premium of 10%[37] was applied to the price of its coupé counterpart. For hybrid models, a premium of 15%[38] was applied to its non-hybrid counterpart.

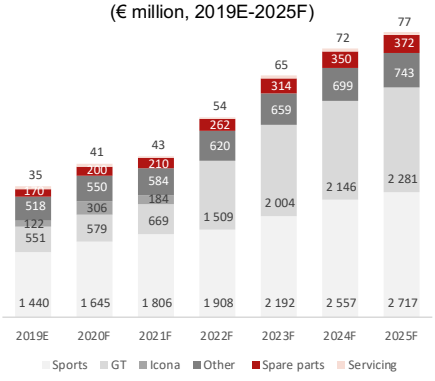
The first V6 model is expected to carry the same price as the most recent Portofino, the cheapest GT model available. For the *Purosangue*, a peer analysis was conducted. The average of the prices charged for comparable vehicles led to a price of €262,879[39]. No evolution on price was performed because the first version of the *Purosangue* is expected to be sold until 2025, inclusively, so no further versions will be introduced during the explicit forecasting period.

Regarding the Icona range, according to research, both Icona models will have a manufacturer's price of €1,224,624. As for other cars category, revenues were forecasted as the historical revenue average times its historical growth rate in the price. We took an average of the price growth in each sub-category (special series, *fuori-serie*, one-offs, track cars and hypercars) and arrived at a global annualized price growth rate of 6.2%. By analyzing the lifecycles of the models included in this category, we concluded that the years 2016, 2017 and 2018 are a good proxy for forecasting, as it accounts for the phase-in and out of models. While we don't believe that the quantities made available for these cars will change in the future, we expect its prices to increase, as it happened in the past. For this reason,

## Spare parts and Servicing

Historically, spare parts and servicing represent 6.5% and 1.3%, respectively, of car revenues (Chart 37). We assume these rates will remain constant.

**Chart 37:**
Revenues cars, spare parts and servicing (€ million, 2019E-2025F)




Source: Nova Research Team

[35] The car prices used in this analysis reflect the prices practiced in the USA because it was the information that was more widely available. The prices found are before-tax, so to reach the manufacturer's price we only deducted the dealer's commission, which is around 10% for the luxury industry (Chron. 2018. "How Much Commission Does a Salesman Make on a New Car?". Accessed January 2. https://work.chron.com/much-commission-salesman-make-new-car-21232.html.) To convert the prices from USD to EUR, we used the conversion rates provided in Ferrari's annual reports.

[36] An analysis was conducted for the super sports, regular sports, super GT and normal GT, to understand the price evolution from one model to the next. We concluded that super sports prices increase by 3.1%, regular sports by 4.9%, super GT by 0.4% and regular GT by 0.9%.

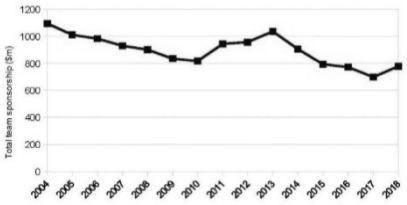
[37] Based on an historical analysis of Ferrari prices, including the F430, 458 Italia and 488 and its coupé counterparts, the research team concluded that convertible models are, on average, 10% more expensive.

[38] A peer analysis was conducted to understand what is the typical premium that a hybrid model has over its non-hybrid counterpart. The available peers were Porsche, BMW, Range Rover, Audi and Mercedes. Premiums range between 7% to 26%, with an average of 15%.

[39] Peers included: Lamborguini Urus (€268,570), Bentley Bentayga (€221,006), Rolls Royce Cullinan (€425,000), Porsche Cayenne Turbo S E-Hybrid (€184,453) and Mercedes Benz G63 (€215,500). This leads to a Purosangue retail price of €262,906 for the ICE and €302,101 for the hybrid powertrain.

- Sponsorship, Commercial and Brand

**Chart 38:**
Total F1 team sponsorship
(2004-2018)

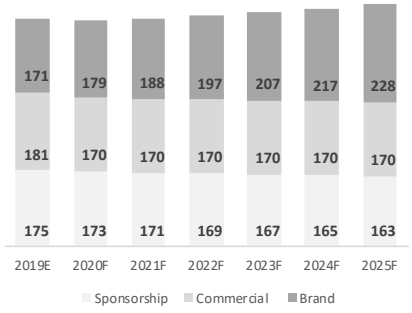



Source: Formula Money Sponsorship Database

Ferrari's F1 team, Scuderia Ferrari, counts with significant sponsorship agreements from companies such as Shell, Ray-Ban and Hublot. Research shows that from 2009 to 2018, total sponsorships averaged €1.8 million per year. However, sponsorship in F1 decreased 5.6%[40] in 5 years (Chart 38), as companies find that other marketing initiatives are more worthwhile. We estimate that from 2019 onwards, F1 sponsorships will decrease by 1.15% per year (Chart 39).

For commercial revenues, a budget is set by F1 and is then split among the teams based on several criteria, not only prior year's performance but also longevity. Ferrari's commercial revenue varies over the years, but a significant portion is stable thanks to the participation and long-standing team payment.

**Chart 39:**
Sponsorship, commercial and brand revenues
(2019E-2025F)




Source: Nova Research Team

Commercial revenues for 2019 are already known. From 2020 onwards, we assume commercial revenues will equal the historical average, which amounts to €170 million[41] per year (Chart 39).

Finally, brand-related revenues come from merchandising, licensing, and royalty income. Most revenues come from Ferrari World Abu Dhabi and Ferrari fashion merchandising, which is rapidly moving towards the luxury segment. According to research, luxury fashion sales growth in 2019 and 2020 ranges from 4.0%-5.0%[42], and amusement parks' growth from 2020 to 2025 is estimated to be 5.8%[43] per year. We used an average of these rates to arrive at future revenues (Chart 39).

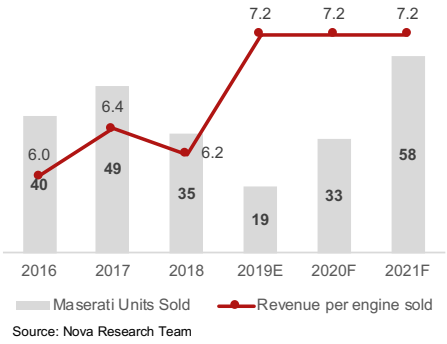
- Engines

**Maserati**

Ferrari has produced engines for Maserati since 2003. Currently, it supplies Maserati with V8 and V6 engines, which account for 8% and 92% of the total revenue coming from Maserati, respectively. The number of engines produced in 2018 decreased by 34%. This event is explained by the slowdown in Maserati car sales (a decrease of approximately 30% between 2017 and 2018). As aforementioned, Ferrari's multi-year arrangement with Maserati to provide V6 engines will terminate at the end of 2020. Moreover, Ferrari's CEO announced that as of 2021 or 2022[44], it will no longer supply V8 engines to Maserati. Once that

[40] Forbes. 2019. "Revealed: Sponsors Fuel Formula One With $30 Billion". Accessed January 2. https://www.forbes.com/sites/csylt/2019/05/19/revealed-sponsors-fuel-formula-one-with-30-billion/#656c03fc2416.
[41] Average of Ferrari's commercial revenues from 2016 to 2019
[42] McKinsey & Company. 2019. "The State of Fashion 2020: Navigating uncertainty". Accessed January 2. https://www.mckinsey.com/industries/retail/our-insights/the-state-of-fashion-2020-navigating-uncertainty.
[43] PR Newswire. 2019. "Amusement Parks Market Worth $70.83 Billion by 2025 | CAGR: 5.8%: Grand View Research, Inc.". Accessed January 2. https://www.prnewswire.com/news-releases/amusement-parks-market-worth-70-83-billion-by-2025--cagr-5-8-grand-view-research-inc-300799422.html.
[44] Driving. 2019. "Ferrari won't supply engines to Maserati after 2022". Accessed January 2. https://driving.ca/ferrari/auto-news/news/ferrari-wont-supply-engines-to-maserati-after-2022.

**Chart 40:**
Revenue per Maserati engine and Maserati units sold
(€ thousand, 2016-2021F)




Source: Nova Research Team

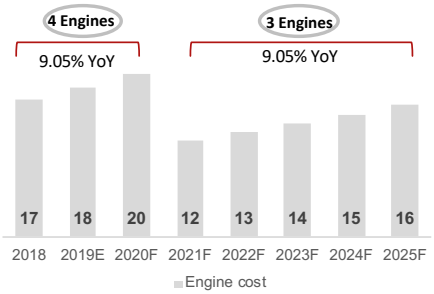
happens, Ferrari has no plans to sell engines to other automakers. Nova Research Team believes that in 2021 Ferrari will stop supplying V8 engines to Maserati. This conviction is connected with the fact that Maserati will want to find as soon as possible an engine supplier for the new models it will launch since it would not make sense to commercialize a new model with a Ferrari engine at first and then switch to a different supplier. To estimate future revenue coming from this segment, we use the following process:

$$Engine\ revenue\ Maserati = Revenue\ per\ engine\ sold \times Maserati's\ units\ sold$$

Ferrari's margins on engine sales to Maserati have been increasing, explained by the start of engine F161's production in 2016 to be installed on Maserati's SUV, one of Maserati's best-selling models (Chart 40). In the first nine months of 2019, Ferrari increased its revenue per engine sold to Maserati to €7.23 thousand. This shall be used as the revenue per engine up until 2022.

Maserati announced plans to modernize its entire fleet plus introducing 10 new car models up until 2023[45]. With that said, we believe 2019 will be a weak year for revenues since no new Maserati models are introduced, and their cars are even more outdated, which is the factor that has been driving Maserati sales down. In the first nine months of 2019, Maserati sales were down 45% compared to 2018. Therefore, to estimate 2019 Maserati units sold, we use -45% as the growth rate. Regarding the years from 2020 to 2022, they will be benevolent since Maserati will start selling nine new models between this period. Therefore, we used a growth rate that allowed the brand to reach its target of 100,000[46] units sold in 2022. From 2020 onwards, to calculate total revenue we multiply its revenue per engine sold by the units sold in that year. Afterwards, to account for the fact that in 2021 Maserati only sells V8 engines, we multiply the total figure by its corresponding V8 weight (8%) since it will no longer supply V6 engines, as aforementioned.

**Chart 41:**
Formula One engine rental cost
(€ million, 2018-2025F)




Source: Nova Research Team

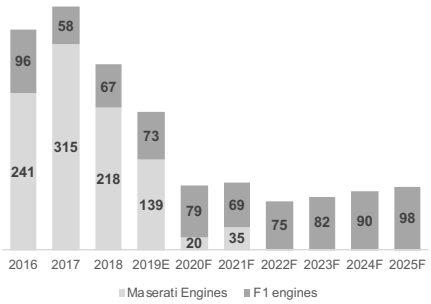
### Formula 1 Teams

When it comes to the sale of engines to F1 teams, historically, Ferrari has always supplied two teams per season except for the year 2016, where it supplied 3. For 2019 and 2020[47], it will supply Haas and Alfa Romeo teams.

Between 2010 to 2018, F1 engines have doubled in costs to produce[48], which averages an increase in engine cost of 9.05% per year. Moreover, in 2021, F1

[45] Motor 1. 2019. "New Maserati, Facelifted Levante, Ghibli, Quattroporte Due In 2020". Accessed January 2. https://www.motor1.com/news/362744/new-maserati-2020-models-updated/.
[46] Automotive News Europe. 2019. Maserati won't see profits until after product offensive starts in 2020". Accessed January 2. https://europe.autonews.com/automakers/maserati-wont-see-profits-until-after-product-offensive-starts-2020.
[47] F1 fansite. 2019. "F1 Teams 2020 Overview". Accessed January 2. https://www.f1-fansite.com/f1-teams/2020-f1-teams/
[48] Forbes. 2019. "Mercedes' F1 Engine Investment Accelerates To $250 Million". Accessed January 2. https://www.forbes.com/sites/csylt/2018/09/23/mercedes-f1-engine-investment-accelerates-to-250-million/#59178fa85fe7

**Chart 42:**
Engines revenues
(€ million, 2016-2025F)




Source: Annual Report 2018 and Nova Research Team

regulation will change, which will contribute to less expensive engines. According to Toto Wolf, Mercedes team principal, in 2018 it cost 16.5€ million[48] to lease a Mercedes engine. Mercedes predicts that after 2021 it will only cost €11.5 million[49] to rent an engine.

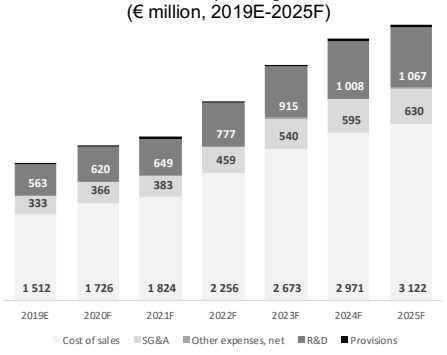
For the year of 2019, we multiplied the lease cost of an F1 engine[50], while considering its rising historical growth cost (9.05%), by the number of engines supplied in 2018 (considering this number remains constant at four in 2019). In 2020, we simply multiplied the 2019 figure by the engine cost growth rate of 9.05%. Regarding the years of 2021 to 2025, we multiply the expected lease cost of an engine (€11.5 million), assuming that the trend of rising costs in the production of engines persists, by the number of teams Ferrari supplies, which we assume it stays constant at 2, by the maximum number of engines an F1 team can use per season without getting a penalty, which is three[51] (Chart 41).

The breakdown of revenue per segment in the Engine business unit can be observed in Chart 42.

- Other

Given the immateriality of this segment, we simply took the growth rate from 2017 to 2018, which is 1.4%, and used it to estimate future revenues. From 2016 to 2017, the revenues decreased because Ferrari N.V disinvested from FFS, so we considered it an unusual year and disregarded it for forecasting purposes.

**Chart 43:**
Selected operating costs
(€ million, 2019E-2025F)




Source: Nova Research Team

## Ferrari's Operating costs

Costs (Chart 43) are mostly computed using ratios observed in the past. However, a more intricate analysis was conducted for Ferrari's costs of sales[52]. These are mostly composed of materials and labor costs and are expected to change in the upcoming years, mainly due to the broad hybridization of Ferrari's range models.

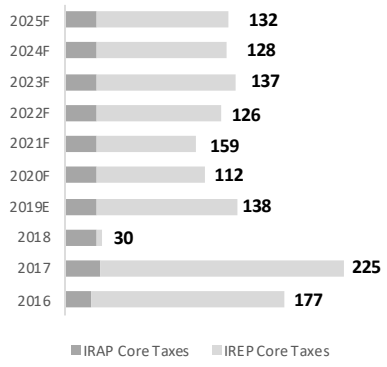
## Taxes

$$\text{Income taxes}_t = \text{EBT}_t \times 24\% + \text{IRES taxes}_{2018} - \text{Patent Box benefits}_t$$

Ferrari's business is subject to various taxations in different jurisdictions (mainly Italy), which include, among others, the Italian corporate income tax ("IRES", which

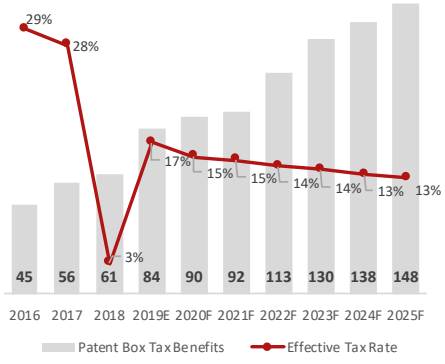
[49] Motorsport. 2017. "F1 customer engine prices set to be lowest ever – Wolff". Accessed January 2. https://www.motorsport.com/f1/news/customer-engine-deals-lowest-ever-mercedes-943813/3041963/.
[50] We used the cost of leasing a Mercedes engine to compute the revenue for the years of 2019 and 2020 since we believe this is a good proxy for the cost of leasing a Ferrari engine. The reasoning comes from the fact that: 1) these two teams are always fighting for the World Championship; 2) when F1 teams are looking for an engine to lease, they care about reliability. In this parameter, a Ferrari engine is as reliable, if not more, than a Mercedes'. Furthermore, it is not the engine that has enabled Mercedes to win the F1 Championship consecutively, but the aerodynamics of the car, which are not related to the engine. Therefore, Nova Research Team believes F1 teams would pay similar amounts to lease either one of the engines.
[51] FIA. 2019. "2021 Formula 1 sporting regulations". Accessed January 2. https://www.fia.com/sites/default/files/2021_formula_1_sporting_regulations_-_2019-10-31_1.pdf.
[52] Silva, Joana. 2019. "How electric vehicles will impact Ferrari's margins".

**Chart 44:**
Total income core taxes
(€ million, 2016-2025F)




Source: Annual Report 2018 and Nova Research Team

**Chart 45:**
Impact of Patent Box in Effective Tax rate
(€ million, 2016-2025F)




Source: Annual Report 2018l Nova Research Team

for the past three years has been constant at 24%) and regional trade tax ("IRAP", which is 3.9%) (Chart 44). In 2018, Ferrari N.V. signed an agreement with the Italian Revenue Agency in relation to the Patent Box tax regime. The regime provides tax benefits for companies that generate income through the use, both direct and indirect, of copyrights, patents, trademarks, designs, and know-how[3]. The agreement is valid for a period of 5 years and is irrevocable and renewable. The current Patent Box ruling for Ferrari expires at the end of fiscal 2019. Ferrari's ability to renew the regime is contingent on future changes to Italian tax legislation.

The firm already applied for a new ruling for the period from 2020 to 2024. "The Decree underlines that subjects which may elect for the regime are the holders of the economic right to use the IP (this makes the regime available not only to owners of the IP but also to licensees) provided they carry out R&D activities. Those who cannot elect for the regime are companies subject to bankruptcy procedures or being compulsory wound up or the extraordinary administration of large firms in crisis"[53]. Therefore, in our analysis, we believe Ferrari will be able to use this regime forever[54] (since "forever" is a dangerous assumption, we further analyze this hypothesis in the "Sensitivity Analysis" section).

Historically, Ferrari has paid an effective tax rate between 25-30%. However, in 2018 its effective tax rate was only 3.5% (Chart 45), since it used the benefits from the Patent Box it accumulated from 2015 to 2018. In total, these benefits amounted to €202 million (Chart 45). With that said, to predict Ferrari's effective tax rate, we separated it in several items: a) we multiply the pre-tax profit by the statutory tax rate (24%); b) afterwards, we sum the taxes coming from IRAP (3.9%)[55]; c) lastly, we subtract benefits coming from the Patent Box[56].

## Balance Sheet

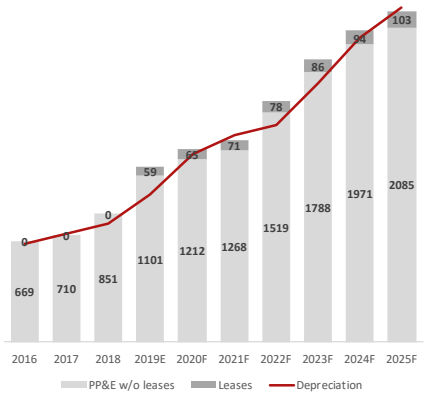
### ▪ Property, Plant and Equipment

**1) PP&E excluding the effects of IFRS 16.** Ferrari's PP&E is mostly comprised of plant, machinery and equipment, followed by industrial buildings and advances and assets under construction, totaling a carrying amount of €850 million in fiscal 2018. Over the years, this item has been increasing due to additions mainly related to car production and engine assembly lines (including those for models to be launched in future years), industrial tools used for the production of cars, and

[53] Expert guides. 2019. "The Patent Box and the recent development under the Italian tax rules. Accessed January 2. https://www.expertguides.com/articles/the-patent-box-and-the-recent-development-under-the-italian-tax-rules/arxrwjgy.
[54] Since this regime was only signed on 29 July 2015, Nova Research Team is unable to estimate the probability of Ferrari being able to consecutively renew its option by looking to other firms track records.
[55] To forecast these taxes, we use the historical value of IRAP taxes Ferrari paid in 2018 and assume it will remain constant for the coming fiscal years.
[56] To forecast the benefits, we calculate them as a percentage of intangible assets since it is correlated with this item.

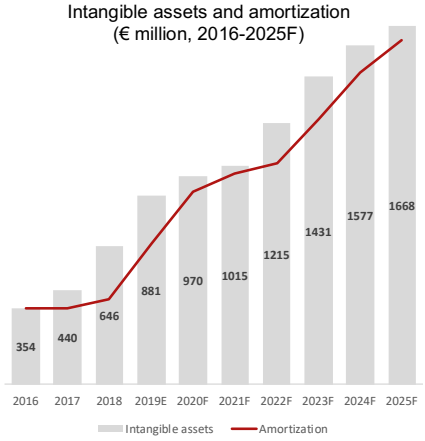
personalization programs[3]. We expect that this item will continue to increase as investments are necessary for hybridization and broadening of the product range to support future launches. We forecasted this item as the percentage of revenues observed in 2018 (Chart 46).

**Chart 46:**
Property, plant and equipment, leases and depreciation
(€ million, 2016-2025F)




Source: Annual Report 2018 and Nova Research Team

**Chart 47:**
Intangible assets and amortization
(€ million, 2016-2025F)




Source: Annual Report 2018 and Nova Investment team

**2) PP&E including the effects of IFRS 16.** From January 1, 2019, the company applies the mandatory IFRS 16, which sets new standards for the recognition of leases, which will impact PP&E because most of the lease agreements relate to Ferrari stores and industrial equipment. As such, this item will increase by the right-of-use-asset, which the company estimates at €59.3 million as of September 2019. According to the company, the right-of-use-asset is categorized as plant, machinery and equipment, industrial buildings, and other assets. In the case of the first two, we assumed that these individual figures will increase by an average of the historical growth rate, 6.4%, and 4.1%, respectively. As for other assets, we assume it will grow in line with the growth of owned Ferrari stores, which has an annualized growth rate of 12.3%. After forecasting the lease asset, we add it to the remaining PP&E, mentioned above (Chart 46).

- Intangible assets

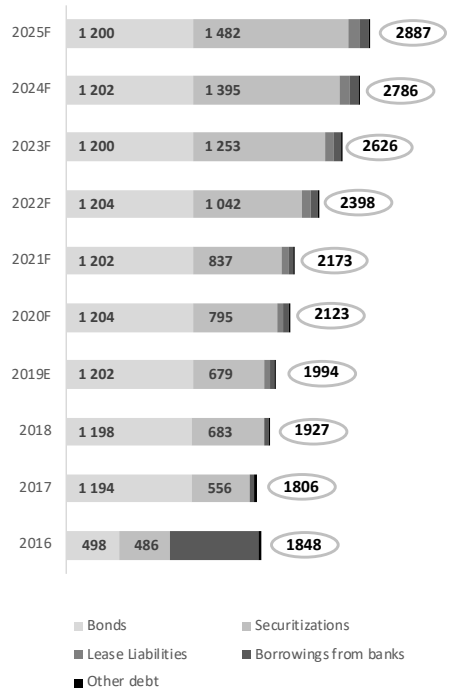
Ferrari's intangible assets are predominantly externally acquired and internally generated development costs. These reflect the capitalization of R&D costs for the creation of new and existing models. As expected, this item has been increasing over the years (24% in 2017 and 47% in 2018) and we project that this trend will continue, as the company is revamping its entire range to include new technologies. Similarly to PP&E, this item was forecasted as a percentage of revenues and set it equal to the 2018 ratio (Chart 47).

- Debt

Debt has four main components: borrowings from banks, bonds, securitization, and lease liabilities, for which we assume book value equals market value (Chart 48).

**1) Borrowings from banks**. To assist in the separation from FCA, Ferrari entered in a €2.5 billion facility which comprised a Bridge loan (€500 million), a Term loan (€1,500 million) and an RCF (€500 million). In 2016 and 2017, Ferrari fully repaid the Bridge Loan and the Term Loan. Nonetheless, the RCF is still undrawn to this day and is considered an off-balance sheet item. Currently, borrowings from banks relate mainly to financial liabilities of FFS Inc to support the financial services operations. FFS Inc main activities are offering retail clients financing for the purchase of Ferrari cars and dealer financing. Consequently, we forecast this

**Chart 48:**
Debt
(€ million, 2016-2025F)




Source: Annual Report 2018 and Nova Research Team

component has a percentage of total revenue from cars since FFS Inc will grow accordingly to the car sales.

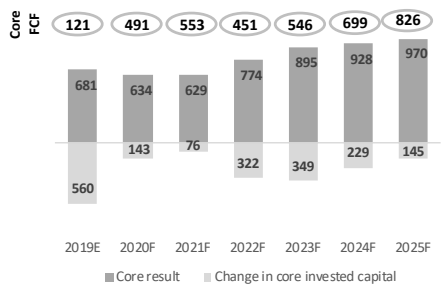
**2) Bonds.** Ferrari issued two bonds, one with maturity until 2021 and another until 2023. To forecast this component, we assume Ferrari rolls over its debt, meaning it will issue 3 more bonds until 2025. We also assume it can issue its future bonds with the exact same characteristics has the past bonds (same issue costs, YTM, coupon, maturity, and price). Our reasoning correlates with the rationale behind why Ferrari issued bonds in the first place. It did so it could pay both the Bridge loan and Term loan in which incurred to help in the separation process from FCA. We do not foresee a future event that will compel Ferrari to raise its debt outstanding. In addition, we also believe Ferrari is better off not repaying its own debt entirely since the automotive industry is very capital intensive hence, in the near/medium future, it will require cash to support its future operational activities, continue its R&D expenditures and execute the buyback program.

**3) Securitization**. Starting in 2016, FFS Inc has pursued a strategy of self-financing, further reducing dependence on intercompany funding and increasing the portion of self-liquidating debt with various securitization transactions[3]. Securitization consists of three revolving programs that support FFS Inc having available capital so that it can then be loaned to clients and dealerships when buying Ferrari' s. We decided to forecast this component as a percentage of total revenue from car sales.

**4) Lease Liabilities**. We set the lease liabilities equal to the right-of-use asset, previously described in the Property, Plant and Equipment section.

## Annuity Period

**Chart 49:**
Core business Free Cash Flow
(€ million, 2019E-2025F)

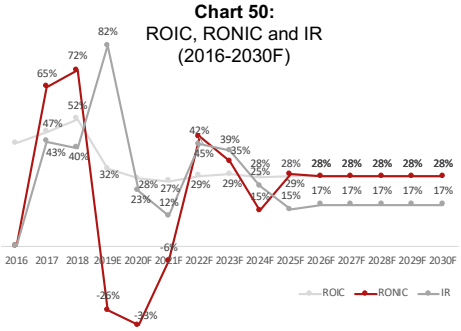



Source: Nova Research team

Ferrari's core business will face significant changes during the explicit forecasting period, so it does not achieve a stable state (Chart 49). In the short-term, Ferrari will disburse vast sums of capital in renovating its fleet, factories, and technology. Hence, its RONIC will be negative and below ROIC. From 2022 to 2025, RONIC becomes positive, primarily driven by cash flows from cars and spare parts. However, there is an unfavorable product mix as the years go by related to a rise in manufacturer costs of hybrid cars, contributing towards a decline in RONIC.

To address this, an annuity period was included in the valuation. The core result and invested capital were projected until 2030, using key ratios from the last year of the explicit forecasting period, 2025. Regarding revenues, we expect it to grow

**Chart 50:**
ROIC, RONIC and IR (2016-2030F)




Source: Nova Research Team

at 5% per year, from 2026 to 2030, consistent with fashion luxury industry sales[42] and luxury automotive industry long-term revenue growth[57].

With this approach, Ferrari achieves a steady state in the last five forecasting years, characterized by a FCF growth rate of 5.0%, a ROIC and RONIC of 28.4% and an investment rate of 16.8% (Chart 50).

## Discount rate

In the long-run the operational risk of a company will converge to the market. To select comparable companies, Nova Research team collected data on several players not only on the automotive industry but also on the luxury industry. We narrowed the list down based on 10 metrics: market cap, enterprise value, short- and long-term debt, cash and marketable securities, revenue, revenue 5 year CAGR, EBITDA, EBIT, net income and operating margin. Taking the median of comparables' unlevered beta adjusted for cash[58], including Ferrari's (Table 6), an equity beta of 0.91 is obtained. Using the CAPM formula with a risk-free rate of -0.36%[59] and a forward-looking market risk premium of 5.69%[60], we arrive at a levered cost of equity of 4.84% (Table 7).

Given the BBB+ rating assigned to Ferrari by CRIF Ratings Agency[61], the annual default rate is 0.5%[62]. Given the expected loss rate given default for unsecured debt of 60%[62] and the YTM of the longer-term bond issued by the company (Bond 2023) of 1.7%, the cost of debt is 1.36%[63] (Table 7).

Finally, an iteration-based analysis was performed to achieve the company's long-term D/E ratio, set at 5.73%[64], and consistent with the evolution of the ratio over the recent years. Using Ferrari's statutory tax rate of 24%, we arrive at a WACC of 4.6% which is used to discount core free cash flows generated by the company after fiscal year 2020.

**Table 6:**
Comparable companies' unlevered betas

| | βu | βu adjusted for cash |
|---|---|---|
| **Ferrari** | **1,03** | **1,07** |
| **Automotive Industry** | | |
| BMW | 0,39 | 0,44 |
| Daimler | 0,33 | 0,39 |
| Renault | 0,38 | 0,49 |
| General Motors | 0,33 | 0,40 |
| Fiat Chrysler | 0,95 | 1,74 |
| Volkswagen | 0,35 | 0,45 |
| Audi | 0,27 | 0,81 |
| Schaeffler | 0,76 | 0,84 |
| **Luxury Industry** | | |
| LVMH | 0,89 | 0,95 |
| Hermés | 0,58 | 1,16 |
| Burberry | 0,72 | 0,83 |
| Moncler | 0,84 | 0,89 |
| Richemont | 0,69 | 0,96 |
| **Average** | **0,61** | **0,82** |
| **Median** | **0,63** | **0,84** |

Source: Nova Research Team

**Table 7:**
Cost of equity, Cost of debt and WACC

| | |
|---|---|
| Beta | 0,91 |
| Risk free rate (annual) | -0,4% |
| MRP (Forward-Looking Eurostoxx 50) | 5,7% |
| **Cost of Equity** | **4,8%** |
| | |
| YTM (Bond 2023) | 1,7% |
| P(default) (BBB+) | 0,5% |
| Expected loss rate | 60% |
| **Cost of Debt** | **1,4%** |
| | |
| **WACC** | **4,6%** |

Source: Nova Research Team

[57] Mordor Intelligence. 2019. "Luxury car market- growth, trends, and forecast (2019-2024)". Accessed January 2. https://www.mordorintelligence.com/industry-reports/luxury-car-market

[58] The betas were computed by regressing the weekly excess returns of each company's stock price, from Jan 2016 until Oct 2019, against the excess returns of the selected proxy for the market portfolio, the Eurostoxx 50. The selected risk-free rate was the 10-year German Government Bond, because Ferrari's main shareholders are European long-term investors.
To unlever the betas, we used the formula: $\beta_u = \frac{\beta_L}{1+(1-t_c)\times\frac{D}{E}}$, using each companies' statutory tax rate and D/E ratio in market values. We then adjusted the unlevered beta for cash with the formula: $\beta_{adj} = \frac{\beta_u}{1-\frac{Cash\ and\ mkt\ securities}{EV}\times(1-t_c)}$.

[59] Return on the 10Y German Government Bond on the 29th of October 2019.

[60] The forward-looking market risk premium was obtained by forecasting the forward-looking return of the Eurostoxx 50, taking its price on the 29th of October 2019 and projecting it until 2030 (to match our forecasting horizon) using the historical growth rate of 4.7%. The cash flows associated with the Eurostoxx 50 are estimated as 3.58% of the price, which is based on historical figures. Discounting these cash flows to arrive at the current price implies a discount rate of 5.33%, which is the forward-looking return on the market. We then deduct the current risk-free rate (-0.36%) to arrive at the forward-looking market risk premium

[61] CRIF Ratings. 2019. "CRIF Ratings has affirmed Ferrari's long-term issuer rating at "BBB+/Stable". Accessed January 2. https://www.crifratings.com/en/rating-actions/ferrari-spa-12042019-rating-update-unsolicited/.

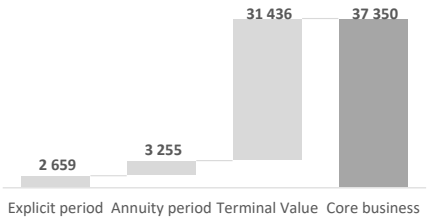
[62] Moody's Global Credit Policy. 2012. "Corporate Defaults and Recovery Rates, 1920-2011".

[63] $r_d = YTM - P(default) \times Loss\ given\ default$

[64] In this analysis, we discovered what would be the necessary D/E ratio for the market cap yielded by the DCF model to equal the market value of equity implied by the ratio itself. The debt value used in this analysis was the book value of debt in 2020F.

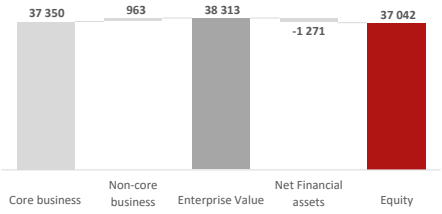
## DCF Valuation

**Chart 51:**
Core business DCF valuation waterfall
(€ million, 2020F)




Source: Nova Research Team

**Chart 52:**
Valuation waterfall
(€ million, 2020F)




Source: Nova Research Team

To perform a DCF valuation, we computed the core business free cash flow[65] until 2030 and discounted it using the WACC from 2021 onwards. We then calculated the core terminal value using the terminal value growth rate of 2.5%[66], slightly above the expected inflation of 2.1%[67](Chart 51).

The non-core business was valued at book value[68] of fiscal 2020 because we believe that using the DCF method with the same discount rate used for the core business would mislead the valuation. For instance, financial investments are not part of the company's main business and are thus subject to different value drivers. In the case of employee benefits, we believe these are not strictly necessary for Ferrari's operations.

With an enterprise value of €38,313 million and net financial assets of -€1,271 million, we arrive at an equity value of €37,042 million in 2020 (Chart 52). As the forecasted number of common shares outstanding is 185,164,441[69], the implied share price is €200.05.

## Multiples Valuation

**Table 8:**
Comparable companies KPIs
(€ million, Dec 31 2018)

| | Market cap | D/E | EBIT | Rev 5Y CAGR | Op margin |
|---|---|---|---|---|---|
| Ferrari | 16 381 | 12% | 827 | 7,9 | 24 |
| **Automotive Industry** | | | | | |
| BMW | 46 014 | 222% | 9 071 | 5,1 | 9 |
| Daimler | 49 116 | 295% | 10 266 | 7,2 | 6 |
| Renault | 16 132 | 327% | 2 987 | 7,0 | 5 |
| General Motors | 42 610 | 222% | 4 012 | - 1,1 | 3 |
| Fiat Chrysler | 19 579 | 74% | 5 164 | 5,0 | 5 |
| Volkswagen | 69 693 | 274% | 13 920 | 3,7 | 6 |
| Audi | 33 626 | 12% | 3 509 | 3,5 | 6 |
| Schaeffler | 4 967 | 67% | 1 354 | 4,9 | 10 |
| **Luxury Industry** | | | | | |
| LVMH | 130 415 | 8% | 9 854 | 10,0 | 21 |
| Hermés | 51 180 | 2% | 2 128 | 9,7 | 36 |
| Burberry | 8 213 | 0% | 475 | 6,5 | 15 |
| Moncler | 7 401 | 1% | 414 | 19,6 | 29 |
| Richemont | 44 690 | 17% | 1 673 | 1,6 | 8 |

Source: Bloomberg
Note: D/E ratio in market values, assuming MVD=BVD

To perform a multiples valuation, we selected a set of comparable companies (Table 8) based on a wide range of criteria, as previously mentioned. Forward-looking enterprise value and equity value multiples were extracted from Thomson Reuters Eikon for the year 2020 (Table 9), and the 4th quartile of the sample was used to value Ferrari. We made this decision because comparable companies trade at very low multiples compared to Ferrari, particularly automotive industry peers. Ferrari is in a unique position as it is the only stand-alone publicly traded luxury automotive manufacturer, so there are no true available comparables.

Given the industry characteristics, we believe that sales multiples may be misleading since the companies have very different margins. The P/E ratio may also be misleading since it is highly affected by the company's capital structure.

[65] $Core\ FCF_t = Core\ result_t - Increase\ in\ core\ invested\ capital_t$

[66] Nova Research Team believes that in perpetuity RONIC will equal WACC. Ferrari will eventually lose its competitive advantages, which are mainly related to the driver experience. In an ever-changing industry where one day CASE mobility will dominate, Ferrari might not be able to sustain its superiority as a manufacturer of luxury cars. We believe it is better to take a conservative view regarding very far into the future growth opportunities. Furthermore, Ferrari N.V also shares a conservative view regarding their future growth opportunities. In the Annual Report 2018 it reports a long-term growth rate of 2%.

[67] Average of expected inflation from 2022 onwards for the geographies where the company operates, weighted by the revenues generated by each geographic area in 2018. (Inflation rates: Europe 1.8%, USA 2.0%, China 3.0%, APAC 3.4%). European Central Bank Eurosystem. 2020. "HICP Inflation forecasts". Accessed January 2. https://www.ecb.europa.eu/stats/ecb_surveys/survey_of_professional_forecasters/html/table_hist_hicp.en.html. International Monetary Fund. 2019. "Inflation rate, average consumer prices Annual percent change". Accessed January 2. https://www.imf.org/. Federal Open Market Committee. 2019. "Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents under their individual assessments of projected appropriate monetary policy, June 2019". Accessed January 2. https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20190619.htm.

[68] The valuation of the non-core business using book values lies in the assumption that book values are a good proxy for market values.

[69] Departing from the 187,921 thousand common shares outstanding reported in the Annual Report 2018, we deducted the repurchases planned for 2019 (2,769 thousand shares) and added the common shares issued under the equity incentive plan reported in the Q3 2019 report (358 thousand). Share repurchases in 2020 are expected to occur only in the first half of the year[16] so we took an average of half of the repurchases of 2018 and 2019 (951 thousand shares). As for the share issuances, we estimated the PSUs and RSUs to vest in 2020 to equal 605 thousand shares. This leads to a total of 185,164 thousand shares outstanding by the Dec 31 2020.

**Table 9:**
Forward-looking multiples (FY2020)

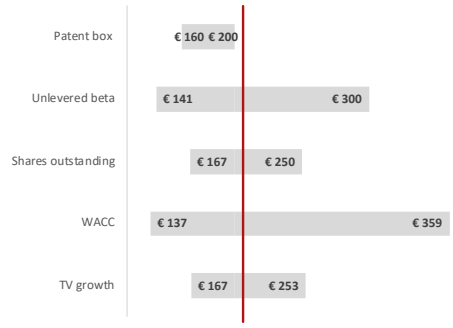
| | RACE IM Equity | Q1 | Q2 | Q3 | Q4 |
|---|---|---|---|---|---|
| EV/Revenue | 7,4x | 0,9x | 1,3x | 3,2x | 9,0x |
| EV/EBITDA | 20,8x | 7,8x | 11,1x | 13,2x | 22,9x |
| EV/EBIT | 28,7x | 12,6x | 17,4x | 18,3x | 26,4x |
| P/E | 37,2x | 6,0x | 8,7x | 23,7x | 40,7x |
| P/Sales | 7,1x | 0,3x | 0,4x | 3,0x | 9,3x |
| P/Book | 12,4x | 0,7x | 1,4x | 4,9x | 8,9x |

Source: Thomson Reuters Eikon

**Chart 53:**
Multiples valuation football field (2020F)


Source: Nova Research Team

**Chart 54:**
Sensitivity analysis




Source: Nova Research Team

Ferrari has a meager D/E ratio compared to peers, so the P/E ratio is not the most appropriate multiple. We put more emphasis on EBITDA and EBIT multiples. The latter is particularly appropriate as it accounts for the impact of CAPEX, which is of paramount importance in capital-intensive industries such as the auto. Ferrari's multiples valuation results in a share price of €96 (Chart 53), which leads to a sell recommendation.

As previously mentioned, we believe Ferrari has no available true comparables, and to arrive at a reasonable valuation, we had to take the very optimistic view that Ferrari is among the best performers in the selected sample. For this reason, and the wide range of share prices achieved through the different multiples, we believe this method is not the most appropriate for this company.

## Sensitivity Analysis

Nova Research team performed a sensitivity analysis (Chart 54) by changing the following four inputs in an interval between -20% and 20% since we believe they either meaningfully impact the share price or are yet to be defined in a future period: 1) long-term growth rate; 2) weighted average cost of capital; 3) Patent Box, in our model, as previously mentioned, we assume Ferrari will be able to collect benefits from this regime forever. We do believe this is an optimistic assumption, so it is vital to assess the impact if the regime ends in different periods throughout the valuation; 4) number of shares outstanding, Ferrari is currently performing a share buyback program that will end until June 2020. Moreover, Ferrari has dilutive shares (PSUs and RSUs), and their issuance depends upon certain targets to be met in the future.

Moreover, the following variables were also analysed: 5) growth rate of both price and quantity for the sports, GT, and other classes; 6) *Purosangue* quantity growth rate. However, Nova Research Team concluded their variance is negligible when the interval mentioned above is applied.

Lastly, we computed a 95% confidence interval for the unlevered beta of Ferrari and selected comparable companies. Nova Research Team concluded that the stock price is highly sensitive to changes in this input. This is explained by the standard error of the regression of each company against the Euro Stoxx 50.

# Appendix

## Income Statement

| (€ thousand) | Historical | | | Explicit forecast period | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Reformulated Income Statemen** | **2016** | **2017** | **2018** | **2019E** | **2020F** | **2021F** | **2022F** | **2023F** | **2024F** | **2025F** |
| **Core** | | | | | | | | | | |
| Revenue | 3 105 084 | 3 416 890 | 3 420 321 | 3 671 611 | 4 040 252 | 4 227 936 | 5 063 949 | 5 961 135 | 6 569 637 | 6 951 586 |
| Cost of sales | - 1 352 009 | - 1 448 744 | - 1 408 575 | - 1 512 062 | - 1 725 918 | - 1 823 531 | - 2 256 061 | - 2 672 691 | - 2 970 830 | - 3 122 373 |
| SG&A | - 290 211 | - 303 762 | - 306 163 | - 332 741 | - 366 149 | - 383 158 | - 458 922 | - 540 230 | - 595 376 | - 629 990 |
| Other expenses, net | - 9 032 | - 6 470 | - 2 736 | - 9 547 | - 9 547 | - 9 547 | - 9 547 | - 9 547 | - 9 547 | - 9 547 |
| R&D | - 507 153 | - 553 585 | - 524 851 | - 563 411 | - 619 980 | - 648 780 | - 777 067 | - 914 740 | - 1 008 116 | - 1 066 726 |
| Provisions | - 82 418 | - 13 473 | - 15 573 | - 21 627 | - 24 544 | - 25 886 | - 31 832 | - 37 608 | - 41 724 | - 43 853 |
| Depreciation & Amortization | - 247 717 | - 260 606 | - 288 748 | - 412 971 | - 547 440 | - 602 335 | - 631 076 | - 754 201 | - 886 397 | - 976 839 |
| Rent | - 14 820 | - 16 964 | - 15 358 | - | - | - | - | - | - | - |
| Result before taxes | 601 725 | 813 286 | 858 318 | 819 251 | 746 674 | 734 698 | 899 443 | 1 032 117 | 1 057 648 | 1 102 258 |
| Adjusted taxes | 177 087 | 224 871 | 29 607 | 138 200 | 112 424 | 105 295 | 125 882 | 137 385 | 129 718 | 131 765 |
| **Core result** | **424 638** | **588 415** | **828 711** | **681 052** | **634 249** | **629 403** | **773 561** | **894 732** | **927 931** | **970 492** |
| **Non-core** | | | | | | | | | | |
| Result from Investments | 3 066 | 2 437 | 2 665 | 2 914 | 3 187 | 3 485 | 3 811 | 4 168 | 4 558 | 4 984 |
| Pension expenses | - 9 709 | - 40 307 | - 34 476 | - 29 798 | - 29 154 | - 29 684 | - 34 294 | - 38 319 | - 39 997 | - 41 972 |
| Result before taxes | - 6 643 | - 37 870 | - 31 811 | - 26 883 | - 25 967 | - 26 198 | - 30 483 | - 34 151 | - 35 439 | - 36 988 |
| Adjusted taxes | - 1 827 | - 9 089 | - 7 635 | - 6 452 | - 6 232 | - 6 288 | - 7 316 | - 8 196 | - 8 505 | - 8 877 |
| OCI | 36 929 | 9 678 | - 3 093 | - | - | - | - | - | - | - |
| **Non-core result** | **32 113** | **- 19 103** | **- 27 269** | **- 20 431** | **- 19 735** | **- 19 911** | **- 23 167** | **- 25 955** | **- 26 934** | **- 28 111** |
| **Financial** | | | | | | | | | | |
| Net Financial Expenses | - 27 729 | - 29 260 | - 23 563 | - 26 082 | - 27 670 | - 28 000 | - 30 988 | - 33 969 | - 35 861 | - 36 782 |
| Result before taxes | - 27 729 | - 29 260 | - 23 563 | - 26 082 | - 27 670 | - 28 000 | - 30 988 | - 33 969 | - 35 861 | - 36 782 |
| Adjusted taxes | - 7 625 | - 7 022 | - 5 655 | - 6 260 | - 6 641 | - 6 720 | - 7 437 | - 8 153 | - 8 607 | - 8 828 |
| Non-controllling interest (OCI) | - 134 | - 337 | - 50 | - | - | - | - | - | - | - |
| **Financial result** | **- 20 238** | **- 22 575** | **- 17 958** | **- 19 822** | **- 21 029** | **- 21 280** | **- 23 551** | **- 25 817** | **- 27 254** | **- 27 954** |
| **Consolidated result** | **436 513** | **546 737** | **783 484** | **640 798** | **593 485** | **588 212** | **726 843** | **842 961** | **873 742** | **914 427** |

# Balance Sheet

| (€ thousand) | Historical | | | Explicit forecast period | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Reformulated Balance Sheet** | **2016** | **2017** | **2018** | **2019E** | **2020F** | **2021F** | **2022F** | **2023F** | **2024F** | **2025F** |
| **Core Invested Capital** | | | | | | | | | | |
| Goodwill | 785 182 | 785 182 | 785 182 | 785 182 | 785 182 | 785 182 | 785 182 | 785 182 | 785 182 | 785 182 |
| Intangible assets | 354 394 | 440 456 | 645 797 | 881 187 | 969 660 | 1 014 705 | 1 215 348 | 1 430 672 | 1 576 713 | 1 668 381 |
| Property, plant and equipment | 669 283 | 710 260 | 850 550 | 1 160 797 | 1 276 972 | 1 339 466 | 1 597 137 | 1 873 916 | 2 064 936 | 2 188 936 |
| Inventories | 323 998 | 393 765 | 391 064 | 419 795 | 479 168 | 506 269 | 626 353 | 742 022 | 824 794 | 866 867 |
| Trade receivables | 243 977 | 239 410 | 211 399 | 257 560 | 283 419 | 296 585 | 355 231 | 418 167 | 460 853 | 487 646 |
| Other current assets | 53 729 | 45 441 | 64 295 | 60 460 | 66 530 | 69 621 | 83 387 | 98 161 | 108 181 | 114 470 |
| Cash and cash equivalents | 62 102 | 68 338 | 68 406 | 73 432 | 80 805 | 84 559 | 101 279 | 119 223 | 131 393 | 139 032 |
| Provisions | - 215 227 | - 197 392 | - 182 539 | - 180 575 | - 181 528 | - 183 823 | - 192 065 | - 206 082 | - 224 215 | - 244 477 |
| Other liabilities | - 656 275 | - 620 350 | - 589 743 | - 633 071 | - 696 634 | - 728 995 | - 873 143 | - 1 027 838 | - 1 132 758 | - 1 198 615 |
| Trade payables | - 614 888 | - 607 505 | - 653 751 | - 674 506 | - 769 903 | - 813 447 | - 1 006 392 | - 1 192 243 | - 1 325 238 | - 1 392 839 |
| **Total core invested capital** | **1 006 275** | **1 257 605** | **1 590 660** | **2 150 260** | **2 293 672** | **2 370 121** | **2 692 316** | **3 041 179** | **3 269 841** | **3 414 583** |
| **Non-core invested capital** | | | | | | | | | | |
| Investments and other financial assets | 33 935 | 30 038 | 32 134 | 35 140 | 38 428 | 42 023 | 45 955 | 50 254 | 54 956 | 60 098 |
| Receivables from financing activities | 790 377 | 732 947 | 878 496 | 888 402 | 977 601 | 1 023 014 | 1 225 300 | 1 442 388 | 1 589 624 | 1 682 043 |
| Current financial assets | 16 276 | 15 683 | 10 174 | 14 044 | 14 044 | 14 044 | 14 044 | 14 044 | 14 044 | 14 044 |
| Deferred tax assets | 119 357 | 94 091 | 60 744 | 60 744 | 60 744 | 60 744 | 60 744 | 60 744 | 60 744 | 60 744 |
| Current tax receivables | 1 312 | 6 125 | 128 234 | 35 646 | 38 852 | 40 484 | 47 753 | 55 555 | 60 847 | 64 168 |
| Employee benefits | - 91 024 | - 84 159 | - 86 575 | - 94 096 | - 102 514 | - 107 491 | - 125 118 | - 144 010 | - 157 384 | - 166 451 |
| Other financial liabilities | - 39 638 | - 1 444 | - 11 342 | - 17 475 | - 17 475 | - 17 475 | - 17 475 | - 17 475 | - 17 475 | - 17 475 |
| Deferred tax liabilities | - 13 111 | - 10 977 | - 39 142 | - 39 142 | - 39 142 | - 39 142 | - 39 142 | - 39 142 | - 39 142 | - 39 142 |
| Current tax payables | - 41 595 | - 29 160 | - 7 635 | - 7 635 | - 7 635 | - 7 635 | - 7 635 | - 7 635 | - 7 635 | - 7 635 |
| **Total non-core invested capital** | **775 889** | **753 144** | **965 088** | **875 629** | **962 903** | **1 008 566** | **1 204 427** | **1 414 725** | **1 558 580** | **1 650 394** |
| **Total invested capital** | **1 782 164** | **2 010 749** | **2 555 748** | **3 025 890** | **3 256 575** | **3 378 687** | **3 896 744** | **4 455 904** | **4 828 420** | **5 064 976** |
| **Equity** | | | | | | | | | | |
| Equity attributable to owners of the parent | 324 995 | 778 678 | 1 348 722 | 1 805 656 | 1 985 210 | 2 097 490 | 2 567 138 | 3 088 420 | 3 429 789 | 3 647 043 |
| **Total equity** | **324 995** | **778 678** | **1 348 722** | **1 805 656** | **1 985 210** | **2 097 490** | **2 567 138** | **3 088 420** | **3 429 789** | **3 647 043** |
| **Net Financial Assets** | | | | | | | | | | |
| Cash and cash equivalents | 395 682 | 579 368 | 725 258 | 778 542 | 856 710 | 896 507 | 1 073 779 | 1 264 021 | 1 393 050 | 1 474 040 |
| Debt | 1 848 041 | 1 806 181 | 1 927 167 | 1 993 642 | 2 122 926 | 2 172 539 | 2 398 202 | 2 626 306 | 2 786 466 | 2 886 742 |
| Non-controlling interests | 4 810 | 5 258 | 5 117 | 5 133 | 5 150 | 5 166 | 5 182 | 5 199 | 5 215 | 5 232 |
| **Total net financial assets** | **- 1 457 169** | **- 1 232 071** | **- 1 207 026** | **- 1 220 233** | **- 1 271 365** | **- 1 281 197** | **- 1 329 606** | **- 1 367 483** | **- 1 398 631** | **- 1 417 933** |

# Core DCF, Non-core FCF and Financing CF

| (€ thousand) | Historical | | | Explicit forecast period | | | | | | | Annuity period | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2016** | **2017** | **2018** | **2019E** | **2020F** | **2021F** | **2022F** | **2023F** | **2024F** | **2025F** | **2026F** | **2027F** | **2028F** | **2029F** | **2030F** |
| **Core Business** | | | | | | | | | | | | | | | |
| Core result | 424 638 | 588 415 | 828 711 | 681 052 | 634 249 | 629 403 | 773 561 | 894 732 | 927 931 | 970 492 | 1 019 017 | 1 069 968 | 1 123 466 | 1 179 640 | 1 238 622 |
| Core invested capital | 1 006 275 | 1 257 605 | 1 590 660 | 2 150 260 | 2 293 672 | 2 370 121 | 2 692 316 | 3 041 179 | 3 269 841 | 3 414 583 | 3 585 312 | 3 764 578 | 3 952 806 | 4 150 447 | 4 357 969 |
| Change in core invested capital | - | 251 330 | 333 056 | 559 600 | 143 411 | 76 449 | 322 195 | 348 863 | 228 662 | 144 742 | 170 729 | 179 266 | 188 229 | 197 640 | 207 522 |
| **Core FCF** | **424 638** | **337 085** | **495 656** | **121 452** | **490 838** | **552 954** | **451 366** | **545 870** | **699 269** | **825 750** | **848 288** | **890 702** | **935 237** | **981 999** | **1 031 099** |
| **Core DCF** | | | | | **490 838** | **528 476** | **412 289** | **476 539** | **583 433** | **658 464** | **646 492** | **648 768** | **651 051** | **653 343** | **655 643** |
| | | | | | | | | | | | | | | | **Terminal Value** |
| | | | | | | | | | | | | | | | **31 435 994** |
| *Growth in FCF* | *0,0%* | *-20,6%* | *47,0%* | *-75,5%* | *304,1%* | *12,7%* | *-18,4%* | *20,9%* | *28,1%* | *18,1%* | *2,7%* | *5,0%* | *5,0%* | *5,0%* | *5,0%* |
| *Growth in Core result* | *0,0%* | *38,6%* | *40,8%* | *-17,8%* | *-6,9%* | *-0,8%* | *22,9%* | *15,7%* | *3,7%* | *4,6%* | *5,0%* | *5,0%* | *5,0%* | *5,0%* | *5,0%* |
| *ROIC* | *42,2%* | *46,8%* | *52,1%* | *31,7%* | *27,7%* | *26,6%* | *28,7%* | *29,4%* | *28,4%* | *28,4%* | *28,4%* | *28,4%* | *28,4%* | *28,4%* | *28,4%* |
| *RONIC* | *0,0%* | *65,2%* | *72,1%* | *-26,4%* | *-32,6%* | *-6,3%* | *44,7%* | *34,7%* | *14,5%* | *29,4%* | *28,4%* | *28,4%* | *28,4%* | *28,4%* | *28,4%* |
| *IR* | *0,0%* | *42,7%* | *40,2%* | *82,2%* | *22,6%* | *12,1%* | *41,7%* | *39,0%* | *24,6%* | *14,9%* | *16,8%* | *16,8%* | *16,8%* | *16,8%* | *16,8%* |
| *RONIC*IR (=growth in core result)* | *0,0%* | *20,0%* | *20,9%* | *26,0%* | *6,3%* | *3,2%* | *12,0%* | *11,5%* | *7,0%* | *4,2%* | *4,8%* | *4,8%* | *4,8%* | *4,8%* | *4,8%* |
| **Non-Core Business** | | | | | | | | | | | | | | | |
| Non-Core result | 32 113 | - 19 103 | - 27 269 | - 20 431 | - 19 735 | - 19 911 | - 23 167 | - 25 955 | - 26 934 | - 28 111 | | | | | |
| Non-Core invested capital | 775 889 | 753 144 | 965 088 | 875 629 | 962 903 | 1 008 566 | 1 204 427 | 1 414 725 | 1 558 580 | 1 650 394 | | | | | |
| Change in non-core invested capital | - | - 22 745 | 211 944 | - 89 459 | 87 274 | 45 663 | 195 861 | 210 297 | 143 855 | 91 814 | | | | | |
| **Non-Core FCF** | **32 113** | **- 3 642** | **- 239 213** | **69 028** | **- 107 009** | **- 65 574** | **- 219 028** | **- 236 252** | **- 170 789** | **- 119 925** | | | | | |
| **Financial** | | | | | | | | | | | | | | | |
| Financial result | - 20 238 | - 22 575 | - 17 958 | - 19 822 | - 21 029 | - 21 280 | - 23 551 | - 25 817 | - 27 254 | - 27 954 | | | | | |
| Net Financial Assets | - 1 457 169 | - 1 232 071 | - 1 207 026 | - 1 220 233 | - 1 271 365 | - 1 281 197 | - 1 329 606 | - 1 367 483 | - 1 398 631 | - 1 417 933 | | | | | |
| Change in NFA | - | 225 098 | 25 044 | - 13 207 | - 51 132 | - 9 832 | - 48 409 | - 37 878 | - 31 148 | - 19 302 | | | | | |
| Debt cash flows | - 20 238 | 202 523 | 7 087 | - 33 030 | - 72 161 | - 31 112 | - 71 959 | - 63 694 | - 58 403 | - 47 256 | | | | | |
| Equity | 324 995 | 778 678 | 1 348 722 | 1 805 656 | 1 985 210 | 2 097 490 | 2 567 138 | 3 088 420 | 3 429 789 | 3 647 043 | | | | | |
| Change in Equity | - | 453 683 | 570 044 | 456 934 | 179 554 | 112 281 | 469 648 | 521 282 | 341 369 | 217 254 | | | | | |
| Comprehensive Income | 436 513 | 546 737 | 783 484 | 640 798 | 593 485 | 588 212 | 726 843 | 842 961 | 873 742 | 914 427 | | | | | |
| Equity cash flows | - 436 513 | - 93 054 | - 213 440 | - 183 864 | - 413 932 | - 475 932 | - 257 196 | - 321 678 | - 532 373 | - 697 173 | | | | | |
| **Financing CF** | **- 456 751** | **109 469** | **- 206 354** | **- 216 893** | **- 486 093** | **- 507 043** | **- 329 155** | **- 385 373** | **- 590 776** | **- 744 429** | | | | | |

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| | |
|---|---|
| **Buy** | Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period. |
| **Hold** | Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period. |
| **Sell** | Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period. |

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A Work Project, presented as part of the requirements for the Award of a Master Degree in Finance from the NOVA – School of Business and Economics.

# HOW ELECTRIC VEHICLES WILL IMPACT FERRARI'S MARGINS

JOANA ENCARNAÇÃO BENTO DA SILVA & 33952

A Project carried out on the Master in Finance Program, under the supervision of:

(Nuno Vasconcelos e Sá)

JANUARY 2020

How electric vehicles will impact Ferrari's margins

Abstract

The presented work project has the objective of determining the impact of electric vehicle production on the operating margins of luxury car manufacturer Ferrari. A model was developed to determine the specifications of each individual plug-in hybrid model that is expected to be launched during the 2019 to 2025 period. Subsequently, the manufacturing costs of both internal combustion engine and plug-in hybrid vehicles were forecasted for each year, which differ based on the specific active models and the evolution of battery prices. We concluded that Ferrari's operating margins will deteriorate, compared to 2018, as the production of electric vehicles increases.

Keywords

Ferrari, Luxury plug-in hybrid vehicle, Manufacturing costs, Operating margin

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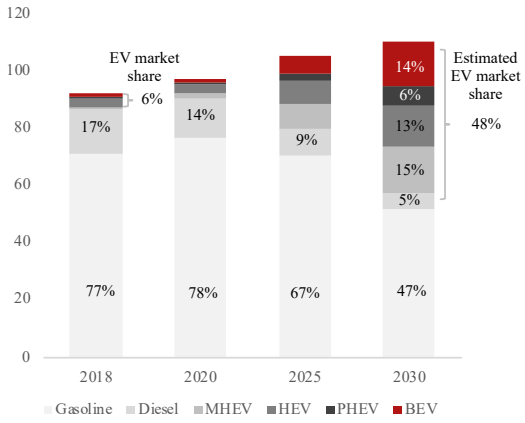
## I. Demand for electric vehicles

EV sales grew to more than 2 million units globally in 2018, an increase of 63% on a year-on-year basis[1]. Nevertheless, EVs still only represent a fraction of the overall light-vehicle market. However, this reality is expected to change, with EVs capturing more and more market share in the years to come (Chart I).

**Chart I:**
Global EV sales
(million units, 2018-2030F)




Source: BCG (The Future of battery production for electric vehicles)
Note: EV=electric vehicle; MHEV=mild electric vehicle; HEV= hybrid electric vehicle; PHEV= plug-in hybrid electric vehicle; BEV= battery electric vehicle.

## II. Types of powertrains

Nowadays, there are many alternatives to the traditional internal combustion engine (ICE) powertrain. Electric vehicles are achieved through the electrification of the automotive powertrain. They include mild hybrid electric vehicles (MHEVs), hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs). Ferrari's product offering has traditionally been exclusively ICE vehicles. However, that is about to change with the introduction of the SF90 Stradale in 2020, the company's first PHEV.

## III. Supply of EV batteries

According to a market model developed by BCG[2] , global capacity for battery cell production will exceed market demand by approximately 40% in 2021. Given the planned expansions in battery production, supply is expected to more than double. And even though global demand for batteries is expected to increase significantly, as we've seen above, it will not catch up with the production capacity in the near term.

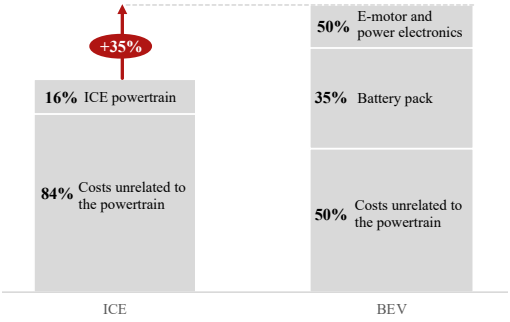
## IV. Ferrari's manufacturing costs

[1] McKinsey & Company. 2019. "Expanding electric-vehicle adoption despite early growing pains". Accessed December 27. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/expanding-electric-vehicle-adoption-despite-early-growing-pains.
[2] The Boston Consulting Group. 2018. "The Future of Battery Production for Electric Vehicles". Accessed December 27. https://www.bcg.com/publications/2018/future-battery-production-electric-vehicles.aspx.

- Internal combustion engine vehicle

According to a study conducted by BCG[2], 16% of an ICE vehicle's manufacturing costs are attributable to the ICE powertrain, and the remaining 84% are unrelated to the powertrain (Chart IV). For this analysis, we considered that manufacturing costs encompass not only the materials but also labour, depreciation, and R&D.

**Chart IV:**
BEV versus ICE vehicle manufacturing costs breakdown




Source: BCG (The Future of battery production for electric vehicles)
Note: ICE= internal combustion engine; BEV= battery electric vehicle. The electric powertrain consists of the electric motor, power electronics and battery pack.

We isolated these costs from the income statement and attributed the ones related to sports and GT[3] cars based on revenues. Dividing by the number of units shipped[4], that we assume is the same as the units manufactured, we conclude that the cost of an ICE Ferrari is €141 thousand in 2018. This implies that the manufacturing costs account for 64.6% of the average car price of €218 thousand[5] observed in 2018, a ratio that we assume will remain constant. Manufacturing costs in the following years (Table I) are obtained based on the average prices.

**Table I:**
Forecast of internal combustion engine manufacturing costs (2019E-2025F)

| (per car, € thousand) | 2019E | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F |
|---|---|---|---|---|---|---|---|
| ICE powertrain | 22 | 23 | 25 | 25 | 26 | 28 | 28 |
| Costs unrelated to powertrain | 117 | 123 | 129 | 131 | 138 | 146 | 146 |
| **Total ICE cost** | **139** | **147** | **154** | **156** | **164** | **174** | **174** |
| Weighted average car price | 215 | 227 | 238 | 242 | 255 | 269 | 269 |
| *ICE cost (% car price)* | *64,6%* | *64,6%* | *64,6%* | *64,6%* | *64,6%* | *64,6%* | *64,6%* |

Source: Nova Research Team

- Battery electric vehicle (BEV)

As for the BEV, the same BCG study[2] suggests that BEVs are up to 35% more expensive to manufacture than ICE vehicles and that 15% of the costs are attributable to the e-motor and power electronics, 35% to the battery pack and 50% are unrelated to the powertrain (Chart

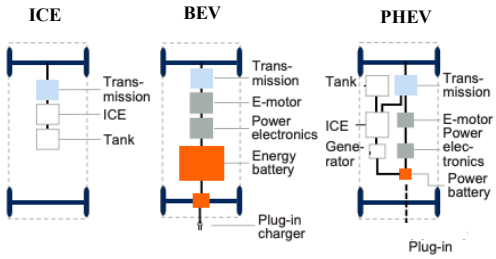
[3] Grand tourism
[4] Sports and GT units shipped per year, from 2016 to 2018, respectively: 7373, 7894, 8881
[5] From the main report, computed as:

$$Weighted\ average\ Price_{2018} = \frac{Weighted\ average\ GT\ price_{2018} \times Quantity\ GT_{2018} + Weighted\ average\ sports\ price_{2018} \times Quantity\ sports_{2018} + SUV\ price_{2018} \times Quantity\ SUV_{2018}}{Quantity\ GT + sports, + SUV_{2018}}$$

IV). Knowing this, we increased the manufacturing costs of the ICE vehicle by 35% and applied the breakdowns mentioned above to arrive at the individual component costs. We concluded that a Ferrari BEV would cost €190 thousand to manufacture, in 2018.

- Plug-in hybrid electric vehicle

**Figure I:**
Engineering of ICE vehicle, BEV and PHEV, respectively




Source: McKinsey & Company (Electric vehicles in Europe: gearing up for a new phase?)

A PHEV is a combination of an ICE vehicle and a BEV (Figure I). In fact, besides the components found in ICE vehicles, a PHEV also has an electric motor, power electronics, a battery pack and a generator, all elements present in a BEV. Given the lack of literature on the cost breakdown of PHEVs, we took the projected costs of both an ICE vehicle and a BEV and combined the components that would be necessary for a PHEV[6].

To get to the manufacturing costs of the PHEV, some adjustments had to be made, considering that a PHEV has a much less powerful e-motor and a smaller battery than a pure electric vehicle. For example, the most potent Tesla model (Model S Performance) has a battery of 100 kWh and an e-motor of 451 kW[7] while the SF90 Stradale has a 7.9 kWh battery and 162 kW e-motor[8]. Assuming that a Ferrari BEV would have the same specifications as the Tesla model mentioned above, we conclude that in 2018 a lithium battery would cost Ferrari €665/kWh and the e-motor €63/kW. Assuming the same ICE powertrain costs and costs unrelated to the powertrain from the ICE vehicle, we conclude that a Ferrari PHEV with the same battery capacity and e-motor as the SF90 Stradale should cost €156 thousand to manufacture, in 2018. However, costs change every year based on the specific PHEVs that Ferrari is offering and on the evolution of battery prices. According to research, battery prices

[6]A similar methodology was applied by McKinsey & Company. 2019. "Making electric vehicles profitable". Accessed December 27. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/making-electric-vehicles-profitable. to achieve the manufacturing costs of a BEV departing from an ICE vehicle.

[7] Tesla. 2019. Accessed December 27. https://www.tesla.com/en_gb.
[8] Ferrari. 2019. Accessed December 27. https://www.ferrari.com/en-PT.

decreased 13%[9] in 2019 and are expected to decrease by 10.4%[10] per year from 2020 to 2025. Implying that battery prices will decrease from €665/KWh in 2018 to €299/KWh in 2025.

To forecast PHEV manufacturing costs from 2020 onwards (Table II), we took the ICE vehicle costs per year mentioned above and added the battery and e-motor costs based on our expectation of the subsequent models (Table III) and the proportions in which they will be made available (Table IV).

**Table II:**
Forecast of plug-in hybrid vehicle manufacturing costs
(2020F-2025F)

| (per car, € thousand) | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F |
|---|---|---|---|---|---|---|
| ICE powertrain | 23 | 25 | 25 | 26 | 28 | 28 |
| Costs unrelated to powertrain | 123 | 129 | 131 | 138 | 146 | 146 |
| Battery | 4 | 4 | 5 | 4 | 4 | 3 |
| E-motor & power electronics | 10 | 7 | 7 | 6 | 6 | 6 |
| **Total PHEV cost** | **161** | **165** | **167** | **174** | **183** | **183** |

Source: Nova Research Team

**Table III:**
Specifications of future PHEV models

| | Future PHEV Models | Start | End | Battery (KWh) | E-motor (KW) |
|---|---|---|---|---|---|
| | **Sports** | | | | |
| Super Sports | SF90 Stradale | 2020 | 2025 | 8 | 162 |
| | SF90 Stradale Spider | 2021 | 2025 | 8 | 162 |
| | Sucessor 812 Superfast | 2022 | 2027 | 9 | 140 |
| Sports | Sucessor of F8 Tributo | 2023 | 2027 | 9 | 71 |
| | Sucessor of F8 Tributo Spider | 2024 | 2027 | 9 | 71 |
| | **GT** | | | | |
| GT | V6 | 2021 | 2024 | 9 | 71 |
| | Sucessor of 1st V6 | 2024 | 2027 | 13 | 101 |
| | Sucessor Portofino | 2022 | 2025 | 9 | 71 |
| | Purosangue | 2022 | 2025 | 14 | 100 |
| Super GT | Sucessor Ferrari Roma | 2023 | 2026 | 9 | 120 |

Source: Nova Research Team

**Table IV:**
Hybrid models quantity breakdown

| | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F |
|---|---|---|---|---|---|---|
| **Quantity** | | | | | | |
| Super Sport | 14% | 14% | 11% | 10% | 10% | 10% |
| Normal Sport | 53% | 53% | 41% | 38% | 38% | 38% |
| Super GT | 11% | 11% | 9% | 8% | 8% | 8% |
| Normal GT | 22% | 22% | 17% | 16% | 16% | 15% |
| Purosangue | 0% | 0% | 22% | 29% | 29% | 29% |

Source: Nova Research Team

## V. EV production impact on margins and Conclusion

Besides estimating the manufacturing costs of a single plug-in hybrid, it is interesting to understand how mass production will impact Ferrari's margins. For each year from 2019 to 2025, we took the expected units shipped from sports and GT cars[11] and computed how many would be PHEVs and ICE vehicles based on the hybridization rates from the main report[12]. In 2020, for example, 467 out of 9782 units shipped will be PHEVs. Knowing that an ICE vehicle

[9] Green Car Reports. 2019. "Electric car battery prices dropped 13% in 2019, will reach $100/kwh in 2023". Accessed December 27. https://www.greencarreports.com/news/1126308_electric-car-battery-prices-dropped-13-in-2019-will-reach-100-kwh-in-2023.
[10] McKinsey & Company. 2019. "Making electric vehicles profitable". Accessed December 27. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/making-electric-vehicles-profitable.
[11] Sports cars units shipped from 2019E to 2025F, respectively: 6176, 6561, 6969, 7404, 7865, 8355, 8875; GT cars units shipped (including *Purosangue*) from 2019E to 2025F, respectively: 3088, 3221, 3422, 6737, 8605, 9142, 9712.
[12] Percentage of hybrid cars, in sports and GT range, from 2019E to 2025F, respectively: 0%, 5%, 18%, 27%, 52%, 83%, 83%.

costs €147 thousand to manufacture and a PHEV costs €161 thousand, the manufacturing costs (labour, materials, depreciation and R&D) will total around €1.4 billion in 2020. Computing depreciation as 21.4% of prior year PP&E (which, in turn, is computed as 30% of revenues) and R&D as 15.4% of revenues, we can to isolate costs of sales (mainly materials and labour), which total €0.9 billion in 2020, for sports and GT cars.

Bringing the remaining revenue streams to the analysis assuming that cost of sales represent 41.2% of revenues, as observed in 2018[13], and all the remaining costs as in the main report, we reach the company's income statement (Table V).

**Table V:**
Core-business income statement
(2019E-2025F)

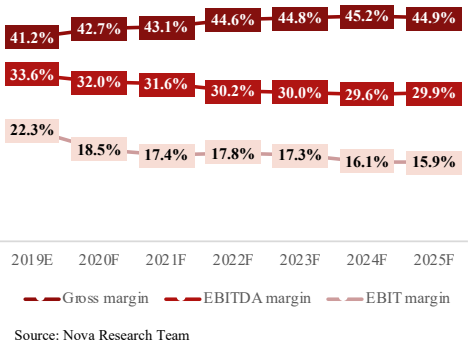
| Income statement (€ thousand) | 2019E | 2020F | 2021F | 2022F | 2023F | 2024F | 2025F |
|---|---|---|---|---|---|---|---|
| Revenue | 3 671 611 | 4 040 252 | 4 227 936 | 5 063 949 | 5 961 135 | 6 569 637 | 6 951 586 |
| Cost of sales | - 1 512 062 | - 1 725 918 | - 1 823 531 | - 2 256 061 | - 2 672 691 | - 2 970 830 | - 3 122 373 |
| SG&A | - 332 741 | - 366 149 | - 383 158 | - 458 922 | - 540 230 | - 595 376 | - 629 990 |
| Other expenses, net | - 9 547 | - 9 547 | - 9 547 | - 9 547 | - 9 547 | - 9 547 | - 9 547 |
| R&D | - 563 411 | - 619 980 | - 648 780 | - 777 067 | - 914 740 | - 1 008 116 | - 1 066 726 |
| Provisions | - 21 627 | - 24 544 | - 25 886 | - 31 832 | - 37 608 | - 41 724 | - 43 853 |
| **Core EBITDA** | **1 232 222** | **1 294 114** | **1 337 034** | **1 530 519** | **1 786 318** | **1 944 045** | **2 079 097** |
| Depreciation & Amortization | - 412 971 | - 547 440 | - 602 335 | - 631 076 | - 754 201 | - 886 397 | - 976 839 |
| **Core EBIT** | **819 251** | **746 674** | **734 698** | **899 443** | **1 032 117** | **1 057 648** | **1 102 258** |

Source: Nova Research Team

## VI. Conclusion

We conclude that Ferrari's gross margin, EBITDA margin and EBIT margin (Chart V) will all deteriorate with the manufacturing of plug-in hybrids. This is consistent with the reality that we see in most car manufacturers that are having trouble reaching the breakeven in their EV sales. Nevertheless, as production levels increase and battery prices decrease, margins will improve, as we can already observe in the forecast the year 2025.

**Chart V:**
Gross margin, EBITDA margin and EBIT margin
(2019E-2025F)




Source: Nova Research Team

[13] With the exception of spare parts and servicing from sports and GT cars, that we assume will have the same margins as the corresponding cars.